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FOURTH ANNUAL REPORT

OF THE

STATE INSPECTOR OF MINES

TO THE

GOVERNOR

OF THE

STATE OF WEST VIRGINIA,

FOR THE YEAR 1886.

JUNE 20 1863

CHARLESTON:
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1887.

ANNUAL REPORT.

To His Excellency, E. W. WILSON,

Governor of West Virginia:

SIR:—In compliance with section 9, of the Mining Act, I herewith submit my report as State Inspector of Mines, for the year 1886.

It is a matter of inconvenience to the inspector that the law requires him to submit his report for the year, on the first day of January, allowing him no time for collecting the data for the entire year, and compiling his report. It is important that an account should be given of each accident that may have occurred in the working of the mines, and the amount of coal and coke produced during the *entire* year; but while the law remains as it is, the reports must be made hurriedly, and the accounts of accidents occuring in the latter part of the year, and the production of coal and coke must be imperfectly stated.

The year 1886 was an eventful one in coal mining in this State. Several large strikes occurred, and the terrible explosion of fire-damp in the Mountain Brook Shaft mine at Newburg, in Preston county, was attended with greater fatality than any other accident that has ever taken place in mining in this State. I have made unusual effort to collect an account of *all* the accidents that have occurred in or about the mines during the entire year, and if I have been successful it gives me pleasure to state that the number of fatal injuries received inside the mines during the year, with the exception of the fatalities attending the explosion at Newburg, is very small; considering the quantity of a coal mined, and would in this respect compare favorably with other States.

A large number of non-fatal accidents are reported, but quite a number of the injuries stated under that head, were not of a serious nature. In compliance with the law requiring the inspector to make suggestions as to mining legislation, I have drawn a bill which is submitted herewith.

I believe that the State needs a better mining law than it has, and my suggestions have been made in the form of a bill because I could in that way express my views more clearly than in any other way. All the mines employing a sufficient number of miners to be within the law, were inspected at least once within the year, many were examined twice, and some of them three or even four times. In every case where a mine has been found in an unsatisfactory condition I have directed that the defects be remedied and the mine put in order.

In a few instances it was found necessary to appeal to the courts to enforce compliance with the law; but my efforts in this direction have not been very successful, and no case under the mining law has yet been tried.

Very Respectfully,

H. J. TUCKER,
Inspector of Mines.

SEWELL, FAYETTE COUNTY, W. VA., January 15, 1887.

PRODUCTION OF COAL AND COKE IN 1886.

The following table shows the estimated production of coal and coke within the State during the year:

As shown in the table a number of operators have failed to report their preduction, and therefore the total production of the State as given below, can be regarded only as an approximation, though I do not believe that it differs materially from the correct amount. The production of small mines employing less than ten persons inside, has not been considered in making the estimate, and is not included in the figures given:

Production of Coal and Coke in 1886, in tons of 2,240 pounds.

COUNTY.	No of Mines Reported.	No of Mines Not Reported	Production of Mines Reported.	Estimated Production of Mines not Reported	Total.	No. of Coke Ovens.	Production of Coke.
Brooke	2	1	15,929	4,500	20,429	......	......
Ohio Marshall	5	8	122,404	102,000	224,404		......
Marion	5	2	125,960	20,000	145,960	30	5,000
Preston	1	2	36,833	42,277	79,110	149	46,113
Mineral	4	0	322,600	......	322,600	......	......
Tucker	0	2	......	20,000	20,000	......	......
Taylor Harrison	4	3	118,361	53,000	171,361	94	23,963
Mason Putnam	6	6	80,857	53,855	134,712	......	......
Kanawha	22	7	648,814	134,000	782,844	......	......
Fayette	23	4	861,116	158 000	1,019,116	843	152,947
Mercer	5	0	292,557	......	292,557	38	600
Total for the State	77	35	2,625,461	587,632	3,213,093	1,154	228 623

The following statement of coal and coke shipped over the Chesapeake & Ohio Railway from mines in West Virginia, during the year 1886, was kindly furnished me by General Wm. C. Wickham, the Second Vice President:

Kind of Coal.	*Tons of* 2,240 *lbs.*
Cannel	15,542
Gas	311,555
Splint and Block	179,089
New River, &c	553 202
Coke	165,406
Total	1,224,794

ANALYSES OF WEST VIRGINIA COALS AND COKES.

The following analyses of West Virginia coals and cokes, are taken from the "*Mineral Resources of the United States, 1883 and 1884*," "*The Coal Trade*," by F. E. Saward, and other sources:

COAL.	Fixed Carbon.	Volatile Matter.	Water.	Sulph'r	Ash.	
Gaston	54.92	39.60	......	.89	4.59	100.
Clarksburg	41.66	56.74	......	......	1.60	100.
Austen	66 28	31 12	.12	......	2.48	100.
Coke—						
Austen	90.56	......	.25	......	9.19	100.
Elk Garden 14-foot bed	89.61	.86	.30	.94	8.24	99.95
Upper Potomac 5-foot bed	90.90	.82	.28	1.26	6.77	99.98
Kanawha and New River Coals—						
Davis Creek	57.48	38.58	2.24	.45	1.70	100.45
Coalburg	62.00	32.50	4.00	.45	1.50	100.45
Cedar Grove	60.67	36.83	......	......	2.50	100.
Coal Valley	61 60	35.20	1.32	.65	1.87	100.64
Hawk's Nest	65.99	32.61	1.45	.74	2.15	
Nuttall	70.66	25.35	1.35	.53	2.10	99.99
Sewell	73.26	23.12	.81	.57	2.24	100.
Fire Creek	75.499	22.425	.735	.536	.805	100.
Quinnimont (lump)	79.25	18 65	.76	.46	1.11	100.23
Pocahontas (Flat Top)	74.06	18.83	.69	.76	5.64	99.98
Kanawha and New River Cokes—						
Davis Creek	93.88	1.14	......	.16	4.98	100.16
Great Kanawha	89.92	1 399	.076	.216	8.605	100.216
Nuttall	91.32	......	......	.92	7.53	99 67
Sewell	94.82	......	.28	.78	4 12	100.
Fire Creek	91.940	.492	.102	.538	6.928	100.
Quinnimont	93 85	......	......	.30	5.85	100.
Pocahontas (Flat Top)	92 095	.99	.54	.895	5.48	100

SUGGESTIONS AS TO LEGISLATION.

The last clause of section 9 of the Mining Law, referring to the duties of the Inspector of Mines, reads: "He shall also make such suggestions and recommendations in relation to said mines, and the proper legislation relating thereto, as he may deem proper and necessary." Certain it is that by constant observation of the methods by which mines are run, and by familiarity with the dangers that threaten underground workmen, combined with his experience in enforcing the law in the discharge of his duties, the Inspector should more readily than any one else, discover the defects of the law and be enabled to suggest improvements that would add to its efficiency; and the provisions of the law requiring him to make such suggestions, is believed to be an important one. Justice would appear to demand that every employer use reasonable precaution to ensure the safety and health of his employes while they are engaged in the performance of his work, but it has been found necessary in all countries where mining is one of the chief industries, to enact laws for the protection of underground workmen, and at present all the great coal producing countries of Europe, including Great Britain, France, Germany and Belgium have mining laws and government inspection of mines. Within the United States, laws for a similar purpose have been enacted, and are now in force in the States of Pennsylvania, Maryland, West Virginia, Kentucky, Tennessee, Ohio, Indiana, Illinois, Missouri, Iowa, Kansas and Colorado, and in the Territories of New Mexico and Washington.

I deem the present mining law of this State defective in several paticulars. The most prominent of these defects are: First, it is too general in its provisions, failing to specify many necessary particulars that might be incorporated in it, and serve to show more definitely what is required.

Second, in cases in which it is persistently disregarded or violated, the penalties provided are too mild, and the methods of imposing them too slow to compel compliance and insure safety. As the law now is, if the inspector finds that it is being violated at a mine, and that in consequence of such violation the mine is in an unsafe or even dangerous condition, he can only notify the operator and require such action to be taken as might be necessary to the safety of the workmen, and whether the operator refuse to regard the notice or not, the inspector could do nothing towards *enforcing* compliance, until the sitting of the next grand jury; he might then be able to have the operator indicted, or he might fail on account of the uncertainty of the law, to convince the jury that a violation had occurred. But should an indictment be found, the case might be continued from term to term of the court for a year or more, without being brought to trial. In the meantime, so far as the law is concerned, the mine might be running just as it would were there no law bearing on the subject. These suppositions are not entirely imagination, but they have been realized by actual experience in this State, within the last eighteen months.

I do not regard it necessary to show further the imperfections of the mining law, as they are apparent to any person with a knowledge of mining, who examines it, but in compliance with the requirements of the law as to suggestion, I have drawn the following bill, which is recommended to the consideration of the Legislature, and which, if it were enacted into a law, it is believed, would at the least, be found superior to the present act. I fully realize that none but wise and well considered laws bearing upon mining, should be passed and that no restrictions should be imposed upon either operator or miner, that are not necessary for the preservation of life and health, or for the ends of justice, and in drawing it I have endeavored to keep this principle constantly in mind.

Several portions of it are taken from the laws of other States, with such alterations, as were believed necessary to make them conform to the requirements of this State, and while it no doubt contains imperfections, it is hoped that it may at least be of service to the Legislature in framing a proper mining law for the State. The power of injunction in cases of danger, or of failure to exercise reasonable precaution against danger, is regarded as one of the most important parts of any mining law for the protection of miners, and had a law similar to the bill here recommended been in force in this State during the last two years, I do not believe that we would have been called upon to witness the Mountain Brook horror, and, though accidents will happen so long as mining is followed, it may be *possible* that some of the *other* accidents recorded in this report, would not have occurred. Another matter worthy of consideration of the Legislature, is the settlement of differences between operators and miners when labor troubles occur. This is a difficult subject, and I am not prepared to offer any definite suggestions as to legislation in reference thereto. The State of Ohio has "An Act to authorize the creation and to provide for the operation of tribunals of voluntary arbitration between employers and employed," and the Hon. Thos. B. Bancroft, Cheif Inspector of Mines of that State, in his report for 1885, mentions two cases of successful arbitration; one of them being a strike of the entire Hocking Valley. I believe that the law has been found to work well in Ohio, and that if a law were enacted in this State that would assist to adjust these labor troubles and at the same time award justice to all parties interested, much good might be accomplished.

I would recommend that chapter 70 of the Acts of the Legislature of West Virginia, passed February 22, 1883, be amended and reenacted so as to read as follows:

1. For the purpose of adopting an efficient system of mine inspection, the State of West Virginia is hereby divided into two mining districts, as follows:

The counties of Barbour, Berkeley, Brooke, Calhoun, Doddridge, Gilmer, Grant, Hampshire, Hancock, Hardy, Harrison, Jackson, Jefferson, Lewis, Marion, Marshall, Mason, Mineral, Monongalia, Morgan, Ohio, Pendleton, Pleasants, Preston, Putnam, Randolph, Ritchie, Roane, Taylor, Tucker, Tyler, Upsuhr, Wetzel, Wirt and Wood shall compose the first district.

The counties of Boone, Braxton, Cabell, Clay, Fayette, Greenbrier. Kanawha, Lincoln, Logan, McDowell, Mercer, Monroe, Nicholas, Pocahontas, Raleigh, Summers, Wayne, Webster and Wyoming shall compose the second district.

2. The Governor shall, on or before the first day of July, one thousand eight hundred and eighty-seven, and in every four years thereafter, appoint one inspector of mines for each of the districts created by the next preceding section, who shall, unless he be sooner removed, as hereinafter provided, continue in office until his successor is appointed and qualified.

Every person so appointed must be a citizen of West Virginia, of temperate habits and of good repute as a man of personal integrity, and must possess a competent practical and theoretical knowledge of mining and mine engineering, and of properly ventilating and draining mines, and of the nature and constituent parts of the noxious gases and impure air of mines, and of the best methods of preventing and removing the same; and he shall not, while in office, be interested as owner, operator, agent, stockholder, superintendent, or mining engineer of any coal mine.

An inspector of mines may be removed from office by the Governor for incompetency, neglect of duty, drunkenness, malfeasance in office, or for other good cause. Vacancies in office of inspector shall be filled by appointment by the Governor for the unexpired term.

3. Every person appointed inspector of mines, shall before entering on the discharge of the duties of his office, take an oath before some person authorized by law to administer oaths, that he will support the Constitution of the United States and the Constitution of the State of West Virginia; and that he will faithfully and impartially and to the best of his ability, discharge the duties of his office, and file a certificate of his having done so in the office of the Secretary of State; and he shall give a bond in the penalty of three thousand dollars, with sureties to be approved by the Governor, conditioned that he will faithfully and impartially discharge the duties of his office. The salary of each inspector shall be —— hundred dollars per annum, and his traveling expenses which shall not exceed seven hundred dollars per annum; such salary and expenses shall be paid quarterly, out of the State Treasury. Provided, that before payment of traveling expenses shall be made to the inspector, he shall file an account of such expenses, and make oath that they were incurred in the discharge of his official duties.

4. Each inspector shall examine the mines of his district as often as practicable, to see that all the provisions of this act are observed and strictly carried out He shall particularly examine into the condition of the mines as to ventilation, drainage and general safety, and shall make a record of all such examinations.

He shall also for each year ending with the 30th day of June, make a report to the Governor, of his proceedings as such inspector, stating therein the number of mines in his district, the number of persons employed in each mine, the condition in which the mines were found, the extent to which this act is obeyed or violated, the number of accidents, and deaths resulting from injuries received in or about the mines, with the cause of each of such accidents and deaths, and such other information in relation to mines and mining, as he may deem of public interest. He shall also suggest or recommend such legislation on the subject of mining, as he may think necessary. Such report shall be filed with the Governor on or before the 15th day of December, next succeeding the year for which it is made.

5. The operator or agent of every coal mine shall within six months after the passage of this act, make or cause to be made, an accurate map or plan of such mine, on a scale to be stated thereon, not exceeding one hundred feet to the inch. Such map or plan shall show the openings or excavations, the shafts, slopes, entries, air-ways, headings, rooms, pillars, etc., the general inclination of the coal strata, and so much of the property lines and of the out-crop of the coal seam of the tract of land on which said mine is located, as may be within one thousand feet of any part of the workings of such mine.

A true copy of such map or plan, shall within the six months aforesaid, be delivered by such operator, to the inspector of his district, to be preserved among the records of his office and turned over to his successor in office; and the original map or a true copy thereof, shall be kept by such operator, at the office of the mine, and open at all reasonable times for the examination and use of the inspector; and such operator shall twice within every twelve months, and not more than seven months apart while the mine is in operation, cause such mine to be surveyed and the map thereof extended so as to accurately show the progress of the workings, the property lines and out-crop as above provided; and he shall immediately thereafter deliver to the inspector of his district, a map or plan and statement of the progress of the workings and extensions aforesaid so as to enable.the inspector to trace the same on the map or plan furnished him as above required.

Before any mine or part of a mine is abandoned, or the pillars drawn therein, it shall be accurately surveyed, and the maps thereof extended as aforesaid, and within one month after any mine is abandoned, the person who was the last operator thereof, shall file with the clerk of the county in which the mine is located, a correct map, showing all the excavations of such mine, to be preserved as a part of the records of the county.

If any operator fail to comply with any provision of this section, the inspector is hereby authorized to have the survey and maps made or extended, as may be necessary in snch case, at the expense of such operator, and the reasonable fees and expenses may be recovered in any court of competent jurisdiction, by the person performing the work.

6. After six months from and after the passage of this act, it shall be unlawful for the operator, or agent of any coal mine, to employ any persons at work in said mine, or permit any persons to be in said mine for the purpose of working therein, unless they are in communication with at least two openings or outlets separated by natural strata of not less than one hundred feet in breadth, if the mine be worked by shaft, and of not less than fifty feet in breadth if worked by slope or drift. To each of said out lets, there shall be provided from the interior of the mine, a safe and available roadway which shall at all times while the mine is in operation, be kept free from all obstructions that might prevent travel thereon in case of an emergency; and if either of said outlets be by shaft, it shall be fitted with safe and available appliances such as ladders, stairs or hoisting machinery which shall at all times when the mine is in operation, be kept in order and ready for immediate use, whereby persons employed in the mine may readily escape in case of an accident.

This section shall not apply to any mine while work is being prosecuted with reasonable diligence, in making communication between said two outlets, so long as not more than twenty persons are employed at any one time in said mine; neither shall it apply to any mine or part of a mine in which the second outlet has been rendered unavailable by reason of the final robbing of pillars preparatory to abandonment, so long as not more than twenty persons are employed therein at any one time.

7. In case a coal mine has but one opening and the owner thereof does not own suitable surface ground for another opening as required by the next preceding section, he may select and appropriate any adjoining land for that purpose and for approach thereto, and he shall be governed in his proceedings in appropriating such land, by the laws in force providing for the appropriation of private property by corporations, and such appropriation may be made whether he is a corporator or not; but no lands shall be appropriated under the provisions of this act, until the court is satisfied that suitable premises cannot be obtained on reasonable terms.

8. The operator or agent of every coal mine worked by shaft shall forthwith provide and hereafter maintain, a metal tube from the top to the bottom of such shaft, suitably adapted to the free passage of sound, through which conversation may be held between persons at the top and at the bottom of the shaft, also the ordinary means of signaling, and an approved safety catch and a sufficient cover overhead on every carriage used for lowering or hoisting persons, and at the top of the shaft an approved safety gate, and adequate brakes on the drum of every machine used to lower or hoist persons in such shaft; and the said operator or agent shall have the machinery used for lowering or hoisting persons into or out of the mine, kept in safe condition and inspected once in each twenty-four hours by some competent person.

9. No operator or agent of any coal mine worked by shaft or slope, shall place in charge of any engine used for lowering into or hoisting out of said mine, persons employed therein, any but competent and sober engineers; and no engineer in charge of such machinery shall allow any person except such as may be deputed for that purpose by the operator or agent, to interfere with any part of the machinery; and no person shall interfere with or intimidate the engineer in the discharge of his duties; and in no case shall more than ten persons ride on any cage or car at one time, and no person shall ride on a loaded cage or car in any shaft or slope.

All slopes or engine-planes, used as traveling-ways by persons in any mine, shall be made of sufficient width to permit persons to pass moving cars with safety; or refuge-holes of ample dimensions and not more than sixty feet apart, shall be made on one side of said slope or engine-plane. Such refuge-holes shall be kept free from obstructions, and the roof and sides thereof shall be made secure.

10. The operator or agent of every coal mine whether worked by shaft, slope or drift, shall provide and hereafter maintain for every such mine, ample means of ventilation, affording not less than one hundred cubic feet of air per minute for each and every person employed in such mine, and as much more as the circumstances may require, which shall be circulated around the main-headings and cross headings and working places, to an extent that will dilute, render harmless and carry off the noxious and dangerous gases generated therein; and as the working places shall advance, breakthroughs for air shall be made in the pillars or brattices shall be used, so as to keep such working-places well and properly ventilated

All mines generating fire-damp shall be kept free of standing gas in the worked out or abandoned parts of the same as far as practicable, and the entrances thereto shall be properly closed and cautionary notice posted to warn persons of danger, and the doors used therein for directing the ventilation shall be so hung as to close themselves and every working-place and all other places where gas is known to exist or is liable to exist, shall be carefully examined by some competent person appointed for that purpose, to be known as "fire-boss," immediately before each shift, with a safety lamp, and in making said examinations it shall be the duty of the fire-boss at each examination, to leave at the face of every place so examined, evidence of his presence; and no workman shall enter or be permitted to enter, any mine or part of a mine, generating fire-damp until it has been examinated by the fire-boss as aforesaid and reported by him to be safe. In all mines generating fire-damp accumulations of fine dry coal dust shall as far as practicable be prevented, and such dust shall whenever necessary, be kept properly watered down. The safety lamps used for examining any mine, or which may be used for working therein, shall be furnished by, and be the property of the operator of the mine, and shall be in charge of an agent thereof; and at least one safety lamp shall be kept at every coal mine whether such mine generates fire-damp or not.

11. In order to better secure the proper ventilation of every coal mine and promote the health and safety of persons employed therein, the operator or agent shall employ a competent and practical inside overseer, to be called "mining-boss," who shall be a citizen and an experienced coal miner, and and shall keep a careful watch over the ventilating apparatus and the air-ways, traveling-ways, pumps and drainage; and shall see that as the miners advance their excavations, proper break-throughs are made as provided in section 10 of this act, and that all loose coal, slate and rock overhead in the working-places, and along the haul-ways, be removed or carefully secured so as to prevent danger to persons employed in such mine; and that sufficient props, caps and timbers are furnished of suitable size and cut square at both ends, and as near as practicable to the proper lengths for the places where they are to be used; and such props, caps and timbers shall be delivered and placed in the working places of the miners, and every workman in want of props or timbers and cap-pieces, shall notify the mining-boss or his assistant of the fact at least one day in advance, giving the length and number of props or timbers and cap-pieces required; but in case of an emergency the timbers may be ordered immediately upon the discovery of any danger; and the place and manner of leaving the orders for timbers shall be designated in the rules of the mine; and shall have all water drained or hauled out of the working-places before the miners enter, and the working places kept dry as far as practicable, while the miners are at work. On all haulways, space not less than ten feet long and two feet six inches wide between the wagon and the rib, shall be kept open at distances not exceeding one hundred feet apart, in which shelter from passing wagons may be secured; and the mining-boss shall within five days after the expiration of each month, mail to the inspector of his district, a report for the preceding month, stating the number of persons employed in the mine, and the number of days worked during the month, and giving an account of each and every accident by which any one may have been injured or killed in or about the mine. It shall furtner be the duty of the mining-boss to have bore-holes kept not less than twelve feet in advance of the face and when necessary on the sides, of the working-places that are being driven towards and in dangerous proximity to an abandoned mine or part of a mine, suspected of containing inflammable gases or which is filled with water. The mining-boss or his assistant shall visit and examine every working-place in the mine at least once in every three days and oftener when necessary, while the miners of such places are at work, and shall direct that each and every working-place be secured by props or timbers wherever necessary, so that safety in all respects be assured, and no person shall be directed to work in an unsafe place, unless it be for the purpose of making it safe. The mining-boss shall notify the operator or agent of the mine, of his inability to comply with any requirement of this section; it shall then become the duty of such operator or agent at once to attend to the matter complained of by the mining-boss, to comply with the provisions hereof. The operator or agent of every coal mine shall keep posted in a conspicuous place at the mine, printed rules defining the duties of all persons employed in or about said mine or colliery.

12. The operator or agent of every coal mine shall furnish the inspectors proper facilities for entering such mine, and making examinations or ob-

taining information; and if any inspector shall discover that any mine does not in its appliances for the safety of the persons employed therein, conform to the provisions of this act, or that by reason of any defect or practice in or at such mine the lives or health of persons employed therein, are endangered, he shall immediately, in writing, notify such operator or agent thereof, stating in such notice the particulars in which he considers such mine to be defective or dangerous, and if he deem it necessary for the protection of the lives or health of the persons employed in such mine, he shall, after giving notice to the said operator or agent, of his intention so to do, apply without bond, to the Circuit Court of the district in which said mine is located, or to the Judge thereof in vacation, for an injunction to restrain the operating of said mine until said danger be removed, and such court or judge when so applied to, shall at once proceed to hear the case and determine the same, and if the cause appear to be sufficient, and such danger appear to exist, after hearing the parties and their evidence, he shall issue an injunction restraining the operating of said mine until the cause of such danger be removed; and the cost of the proceedings, including the charges of the attorney prosecuting the same, shall be borne by the operator of the mine, but no fee exceeding twenty-five dollars shall be taxed in any one case for the attorney prosecuting such case; but if said court or Judge shall find the cause not sufficient, then the case shall be discharged and the costs shall be paid by the county in which the mine is located.

13. No boy under twelve years of age, nor between the ages of twelve and sixteen years, unless he can read and write, nor female person of any age, shall be permitted to work in any coal mine, and in all cases of doubt the parents or guardians of such boys shall furnish affidavits of their ages.

14. No miner, workman nor other person shall knowingly injure any shaft, lamp, instrument, air-course or brattice, or obstruct or throw open air-ways, or carry matches or open lights into places worked by safety lamps, or disturb any part of the machinery, or open a door used for directing the ventilation and not close it again, or enter any part of the mine against caution, or disobey any order given in carrying out the provisions of this act, or do any other act whereby the life or health of any person employed in the mine, or the security of the mine is endangered.

15. Whenever by reason of any explosion or other accident in any coal mine, or the machinery connected therewith, loss of life or serious personal injury shall occur, it shall be the duty of the superintendent of the colliery, and in his absence the mining boss in charge of the mine, to give notice thereof forthwith by mail or otherwise, to the inspector of the district, stating the particulars of such accident, and if any one is killed thereby, to the coroner of the county also, or in his absence or inability to act, to any justice of the peace; and the said inspector shall, if he deem it necessary from the facts reported, immediately go to the scene of such accident and make such suggestions and render such assistance as he may deem necessary for the future safety of the men; and investigate the cause of such explosion or accident, and make a record thereof which he shall preserve with the other records of his office; and to enable him to make such investigation, he shall have the power to compel the attendance of witnesses, and to administer oaths or affirmations; and the costs of such investigation shall be paid by the county in which such accident occurred, in the same manner as the costs of coroners' inquests are now paid. If the coroner or justice shall determine to hold an inquest upon the body of any person killed as aforesaid, he shall impannel a jury, no one of whom shall be directly or indirectly interested; and the inspector of mines, if present at such inquest, shall have the right to appear and testify, and to offer any testimony that may be relevant, and to question and cross-question any witness; and the coroner or justice shall deliver to the inspector a copy of the testimony and verdict of the jury.

16. The operator or agent of every coal mine shall annually during the month of July, mail or deliver to the inspector of his district, a report for the preceding twelve months ending with the 30th day of June. Such report shall state the names of the operator and officers of the mine, the quantity of coal mined, and such other information not of a private nature, as may from time to time be required by the inspector. Blank forms for such reports shall be furnished by the inspector.

17. The circuit court of any county in the proper district, upon a petition (with proper bond for payment of costs) signed by not less than fifteen coal miners who are citizens, or two or more operators of mines, setting forth that any inspector of mines grossly neglects his duty, or that he is guilty of malfeasance in office, shall issue a summons in the name of the State, to the said inspector to appear on not less than fifteen days notice, upon a day fixed, before said court, at which time the court shall proceed to inquire into and investigate the charges of the petitioners; if the court find that said charges are true, it shall certify the same to the Governor who shall declare the office of said inspector vacant and appoint a successor. The costs of said investigation shall, if the charges are sustained, be imposed upon the inspector, but if the charges are not sustained they shall be imposed upo the petitioners.

18. The operator or agent of any coal mine who shall neglect or refuse to perform the duties required of him by any section of this act, or who shall violate any of the provisions hereof, and any person who shall neglect or refuse to perform the duties required of him by section 9, 10, 11, 13, 14 or 15 or who shall violate any of the provisions thereof, or knowingly do any act whereby the health or life of any person employed in a mine or the security of a mine is endangered, shall be guilty of a misdemeanor and upon conviction shall be punished by a fine of not less than fifty dollars. In default of payment of such fine and costs for the space of ten days, the defendant shall be sentenced to imprisonment in the county jail for a period not exceeding three months.

19. The provisions of this act shall apply only to coal mines in which ten or more persons are employed in a period of twenty-four hours. This act shall be in force on and after the first day of July, 1887, except section 2 which shall take effect on its passage.

REMARKS.

INSPECTORS.

I have recommended the division of the State into two districts and the appointment of two inspectors, as I do not believe that one inspector can visit the mines of the State sufficiently often to see that the law is properly observed, and do his other official duties. To make a single tour and examination of the mines of the State requires about fifteen hundred miles travel, and under the most favorable circumstances—at least four months time—but practically it requires much more than fifteen hundred miles travel or four months time to do so. A large majority of the mines should be examined twice or oftener within a year, and to properly attend to the examinations alone would about consume the time of one man, leaving no time for extending the maps on file, (by no means an inconsiderable item) attending to his other office work, and to violations of the law. At present, according to statistics, there is not any other State in the Union mining as much coal as West Virginia, that has not got more than one inspector. Fifteen hundred dollars salary would not be large, for even that salary is not likely to secure the *best* talent when there are persons in the State whose abilities as mining engineers and colliery managers, command a much larger salary.

MAPS.

The possession of a correct map of a mine is a matter of importance to both operator and inspector. To the operator it presents at a glance the extent of the workings, the size of pillars left to support the superincumbent strata, and the system of ventilation, enabling him to correct errors, plan future workings, and to maintain and improve the system of ventilation.

Formerly it was the practice at many mines in this State to work without the assistance of a map; entries and air-courses were driven and pillars left by guess; but no person, whatever may be his experience, can work a large mine and keep it in the most advantageous shape for convenient and profitable operation in this way. Entries and air-courses were frequently driven out of the desired course; in some cases insufficient pillars were left and squeezes would take place, shutting up parts of the mine, causing great expense and rendering it impracticable to mine some valuable coal. The mine-boss could not exactly locate the property line inside the mine, and occasionally the owner of adjoining property might suffer loss. The inspector frequently needs the map of a mine to enable him to give intelligent advice, and in case of accidents, maps are often of great importance.

Old and abandoned mines sometimes become filled with water and noxious gases, and when the same seam of coal is afterwards worked on an adjoining property, by inadvertently breaking through into the old workings, the existence of such accumulations might be a source of much danger to the workmen in the new mine. To enable persons working new mines, to locate the workings of old mines and guard against such dangers, it is recommended that maps of abandoned mines be filed with the clerks of the counties.

OUTLETS.

Nearly all the mines in this State have two outlets, and I believe that at every one of the drifts or slope mines where there is only one at present, another could be provided within six months.

At shaft mines two outlets are of special importance, for there, in the event of the burning down of the wooden structures over and around the top of the shaft, the gases from the fire and burning timbers falling into the shaft, would be taken through the mine by the current and, with the only way of egress cut off by the fire. the chances of persons in the mine escaping death by suffocation would be very few Besides, most shaft mines give off more or less fire-damp, and should an explosion occur, the partition in the shaft for ventilating purposes, is liable to be so injured as to cut off entirely the ventilation, rendering it impossible for rescuing parties to enter the mine until the partition can be repaired and the ventilation partially restored. While this is being done every one in the mine who may have escaped instant death by the explosion, would likely die of the no less fatal after-damp. At the Mountain Brook explosion the partition in the shaft was partly blown out, and several hours elapsed before any one could reach the bottom of the shaft.

A number of fearful disasters caused by working mines with only one outlet, might be named.

On January 16, 1862, at the Hartley Colliery, in England, a large pump beam broke, and a part of it fell into the shaft, knocking out the lining, the cage guides, etc. The *debris* closed the shaft, cut off all communication with the interior of the mine, and it was ten days afterwards before an entrance could be effected. All the persons in the mine numbering 204, perished.

On September 6, 1869, at the Avondale Shaft, in the anthracite regions of Pennsylvania, the ventilating furnace set fire to the wood-work of the shaft, and 110 persons, the whole force in the mine, died from suffocation by gases from the fire.

SAFETY APPLIANCES AT SHAFTS.

The utility of safety appliances at shafts hardly needs comment. They are generally required by the laws of other States. The greater safety supposed to be secured by the use of safety catches on cages that are used for lowering and hoisting persons, has been questioned; but if they are of proper construction and are kept in order, they are doubtless of value, though nothing can add more to safety in this respect than frequent careful examinations of the hoisting machinery, ropes, &c., and the immediate removal or repair of doubtful parts, and safety catches, when in use, should never be made an excuse for not doing so.

VENTILATION AND PRECAUTIONS OF GASEOUS MINES.

Section 10 refers to ventilation and to precautions in gaseous mines. These are matters of the greatest importance, and the law in reference to them should not be obscure in its meaning. As to the quantity of air necessary to be circulated, experience has proven that 100 cubic feet per minute for each inside employee in mines giving off no fire-damp should be circulated, and the laws of other States almost invariably prescribe that amount. For mines giving off fire-damp no fixed quantity can be named, as it has to be determined by the quantity of gas liberated, but it should be ample, and frequently several times the quantity named for non-gaseous mines, should be circulated; but even in mines generating no fire-damp, if an unusual quantity of carbonic acid gas (or black-damp) is given off, or much powder is used, 100 cubic feet of air per minute for each person might be too small. Fortunately, at a number of mines in our State the advantages of splitting the air are beginning to be understood and appreciated. Wherever this can be done the volume of air circulated can be greatly increased, and frequently almost doubled, without increasing the ventilating power. This is evident from the laws governing the friction of air in mines, and the subject is worthy of attention. But whatever may be the volume of air found at the in-take or the out-cast of a mine, it is not conclusive evidence of the condition of the mine as to ventilation; for unless the air be properly distributed, and a fair proportion of it taken to the heads of the workings, it may be of little benefit. As to precautions in mines generating fire-damp, their necessity is plain. To knowingly jeopardize the lives of workmen by a failure to exercise reasonable precaution in such cases, is, I believe, a *crime*, and should be so treated by the law.

The watering down of dust in mines giving off fire-damp, is not generally required by mining laws, and it may be necessary to explain why it is here recommended. On the 13th of March, 1884,, one of the most fearful and violent explosions occurred in the East mine operated by the Southwest Virginia Improvement Company, at Pocahontas, Virginia, by which 114 persons were killed. At the request of the company the American Institute of Mining Engineers appointed a committee to make an investigation to determine the cause of the explosion. The committee consisting of Messrs Stuart M. Buck, of Coalburgh, West Virginia, J. H. Bramwell, of Roanoke

Va., and Edward H. Williams, Jr., of Bethlehem, Pa., reached Pocahontas April 24th, after the accident and remained until May 2d. During this interval they made repeated visits to the mine, examined it carefully in every part and examined twenty-six witnesses. In the report of the committee as published, the following conclusions were submitted:

"The conditions leading to the explosion were the following:

1. The unusual dryness of the mine.
2. The very large quantity of dust in an extremely fine state of division.
3. The constant working of the mine day and night, allowing no time for clearing the air.
4. The use of excessive quantity of powder, largely increasing the quantity of dust.
5. The probable existence of small quantities of fire-damp slowly given off from the coal.
6. The employment of incompetent and inexperienced men.
7. The almost complete stagnation of the air on the east side of the main entry, owing to the fact that the main doors were untended and fastened open, allowing the air to pass up the main entry direct to the fan.
8. The failure to recognize and appreciate the previous warnings of danger given by occasional flashings of unusual extent when shots were fired, indicating the need of special precautions.

The existence of fire-damp in the Pocahontas mine is the disputed point. The committee is not satisfied on the subject, and meanwhile submits the following evidences bearing on the case:

The superintendent and the mine-boss unite in declaring that they had seen no evidence of gas, and that no complaint of gas had been made to them previous to the explosion. The same is true of the timber-man and the man employed to keep the rooms on their true course." * * *

"On opening the mine after the explosion and flooding no trace of fire-damp was found.

On visiting and thoroughly inspecting the mine, the committee found no trace of fire-damp, though ventilation had been only partially restored, especially in the workings to the rise.

On the other hand, there is testimony, although from men generally inexperienced with gas, leading to the belief that when the mine was strongly worked, there was a slight but general escape of fire-damp, too slight to admit of detection except in rare cases, and probably in all cases too slight to occasion danger if unmixed with coal-dust and if diluted by proper ventilation."

The mine is situated near the line of this State and a part of the workings will soon be on this side of the line. I have been through the mine twice since the explosion occurred, at one time when there was scarcely any ventilation, and in no test with an open light did I discover fire-damp. The company has gone to great expense since the explosion to thoroughly ventilate the mine and to keep the dust watered down. They have a 24-foot fan which gives them from 150,000 to 200,000 cubic feet of air per minute.

The mine commissioners of the different countries of Europe, have made a great many elaborate and careful experiments to determine the effect of coal-dust in colliery explosions, and their reports furnish most interesting reading and instructive study, and leave no doubt of the dangerous nature of coal-dust in a fine, dry condition, in the presence of a small per cent. of fire-damp in the atmosphere. In the summary of a report of the British commissioners as published, it is stated that: "It is however well established that even when the air is quite free from fire-damp, an exceptionally inflammable coal-dust, in a very finely-divided and dry condition, and existing in abundance in the immediate vicinity of a blow-out shot, may, when raised by the shot, be ignited so readily, and carry on the flame so rapidly, that it may produce explosive effects of a similar character to those caused by a gas-explosion. The flame as it rushes along, if fed by freshly raised dust, may extend under these circumstances to very considerable distances, with results, resembling in their disastrous nature, those of explosions originated with, and mainly due to fire-damp.

"If a blown-out *powder* shot occurs in a locality where the atmosphere contains a small proportion of fire-damp (even not above two parts in 100 of the air,) the presence of dry, fine and porous dust, even if it be only comparatively slightly inflammable, may give rise to the explosive propagation of flame to distant localities, where either accumulations of inflammable or explosive gas mixture (as in goaves or old working places,) or deposits of very inflammable dust, may take up the explosion and still further extend its disastrous effects."

It is well known that two parts of fire-damp in 100 of air would not be perceived on the flame of a Davy lamp in an ordinary examination for gas. According to Galloway's experiments, when one part of marsh gas (fire-damp) was mixed with 50 parts of air, and a careful test made with a lamp, it gave an " exceedingly faint cap ⅛ inch high.", Therefore, with a large quantity of fine, dry coal dust near places where shots are fired in gaseous mines, there may exist all the elements of a deadly explosion, without the knowledge of the miners, requiring only a blown-out shot perhaps, to start an explosion, disastrous and fatal in its results.

MINING-BOSSES.

It is of the first importance that in every mine a good and competent mine-boss have charge of the workings, but in some instances men have been found in this important position with apparently very little to recommend them for it. On entering a mine with such a boss, it is likely that loose and dangerous pieces of roof will be found overhead along the traveling-ways, stoppings leaky, doors neglected, closing imperfectly, and perhaps against the air-current, drainage poor, air-courses not infrequently made a repository for debris, and men working beyond the air. *All* of these defects are, however, not always the fault of the mine-boss, for unless he be furnished the means with which to keep his mine in order, he can not do it. More accidents occur from falls of roof and coal than from all other causes in mines, and the great carelessness of miners in keeping their working places securely propped is well-known. If sufficient timbers were kept in the working-places, and the mining-bosses were to frequently visit every working place to see that it was kept secure, and promptly discharge any miner who failed to do so, I believe that this class of accidents would diminish greatly in frequency. As to the delivery of timbers in the working-places, the law already requires "a sufficient amount of timber of the proper size and kind," to be kept "at or near the main entrance," and empty mine wagons are continually going from the main entrance into the working places.

Every mine-boss should frequently measure his ventilation to see that he has a sufficient quantity. This he may do without an instrument for that purpose, as follows: Select a part of the air-way that is of uniform size, for fifty feet in length, and where the air current is free from eddies. Flash off one cubic inch of powder at the wind-ward end of the 50 feet, and note the number of seconds it takes the smoke to travel that distance. Multiply the heighth, width and length of the section of the air-way selected, together in feet; multiply their product by 60, the number of seconds in a minute, and divide the result by the number of seconds it took the powder-smoke to travel the distance selected; the quotient will be the number of cubic feet of air passing per minute. Suppose the airway is 5 feet high, 8 feet wide, and the distance selected 50 feet; now if it took 10 seconds for the smoke to pass over this 50 feet, we would have 5x8x50x60 equal to 120,000, divided by 10, is equal to 12,000 cubic feet of air passing per minute.

LABOR TROUBLES

Numerous strikes and labor troubles have occurred throughout the State within the year, though at the present writing (January 14) no difficulty of this kind exists of which I have any knowledge.

The long strike at the Star (Raymond City) mine came to a close June 24th. The cause of this trouble, as I understand, was as follows: The mine closed in June, 1885, on account of low water in the Kanawha river. On the 19th of September following, the company proposed to the miners to resume work at 2 cents per bushel for mining instead of 2½ cents which was formerly paid. The men refused to work at the price offered, and the mine was idle until June 24th, when the miners began work at the reduced price.

On March 1st a strike began at the Boyce, Calderwood and Dana Brothers' mines on Campbell's creek against a reduction from 2½ to 2 cents per bushel for mining. Work was resumed June 15th at the reduced price.

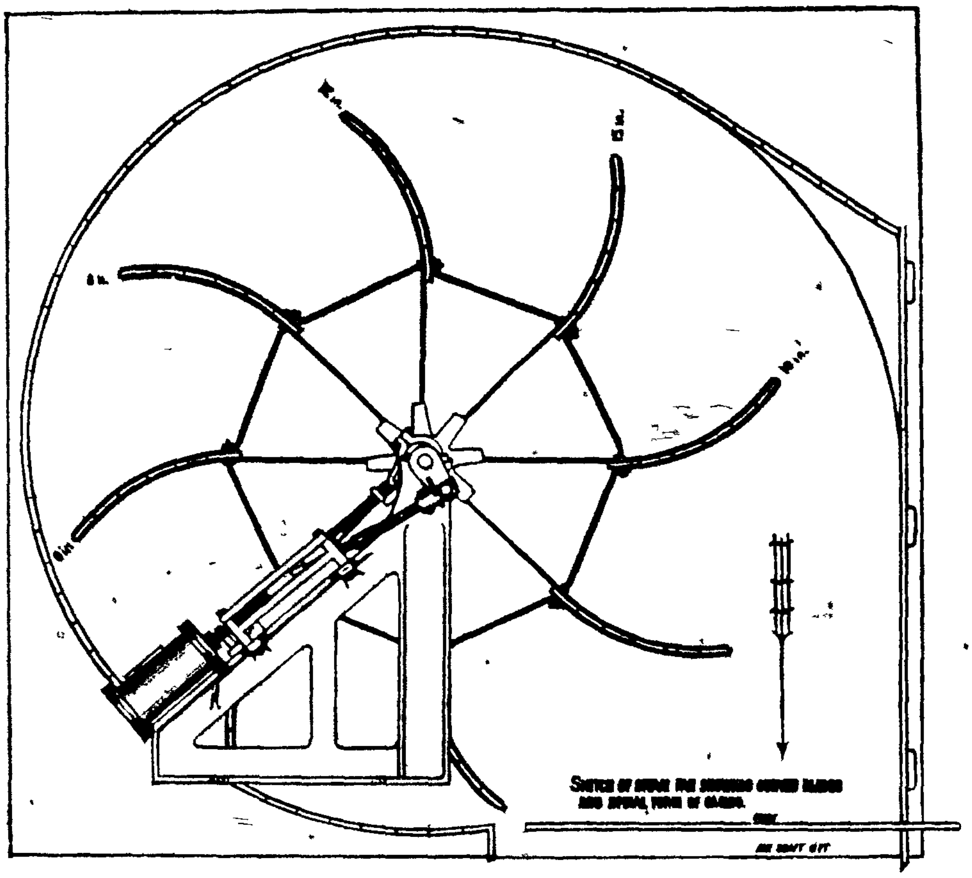
On the 11th of March, a strike involving the Elk Garden, Nos. 1 and 2, the Atlantic and the Armstrong mines, was inaugurated for an advance in the price of mining from 40 to 50 cents per ton. It lasted until June 15th, and the price of mining was not changed.

On May 1st a strike was inaugurated at all the mines on New river except the Quinnimont and Sewell mines, for an advance in the price of mining from 40 to 50 cents per ton. The operators refused to grant the advance, and the mines were idle until the 1st of July. Nothing was gained and the miners returned to work at the old price.

At the same time (May 1st) a similar strike began on Kanawha river at Coalburg, East Bank, Blacksburg, Cedar Grove and Peabody mines for an advance in the price of mining, but it was generally unsuccessful, and the men returned to work in the latter part of June.

The above were the principal labor troubles at mines within the State during the year, but numerous other small strikes have occurred, generally in reference to the price of mining, but in some instances they were on account of dissatisfaction in reference to screens, or the want of scales for weighing coal at the mines.

STEAM FANS FOR VENTILATING MINES.



SECTION OF STEAM FAN.

NOTES.

The casing around the fan-wheel should be built in spiral or expanding form as shown in the cut.

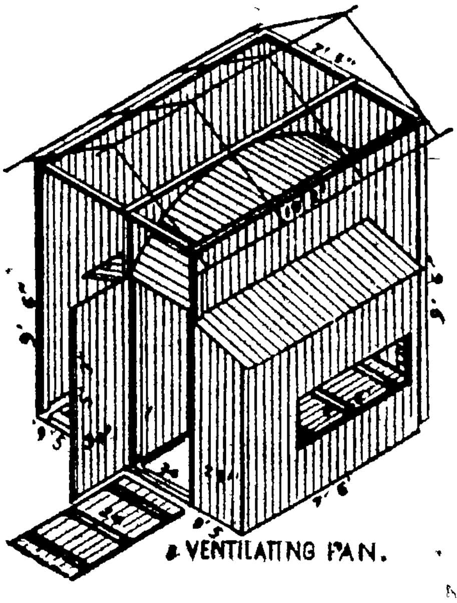
The air is admitted through circular inlets in the casing at the center on the sides, and the diameter of the inlets should be one-half of the diameter of the fan.

At gaseous mines the fan should be so arranged that in case of an explosion, it whould not be wrecked by the shock, for after such an accident it is of the greatest importance that the ventilation be restored at the earliest possible moment.

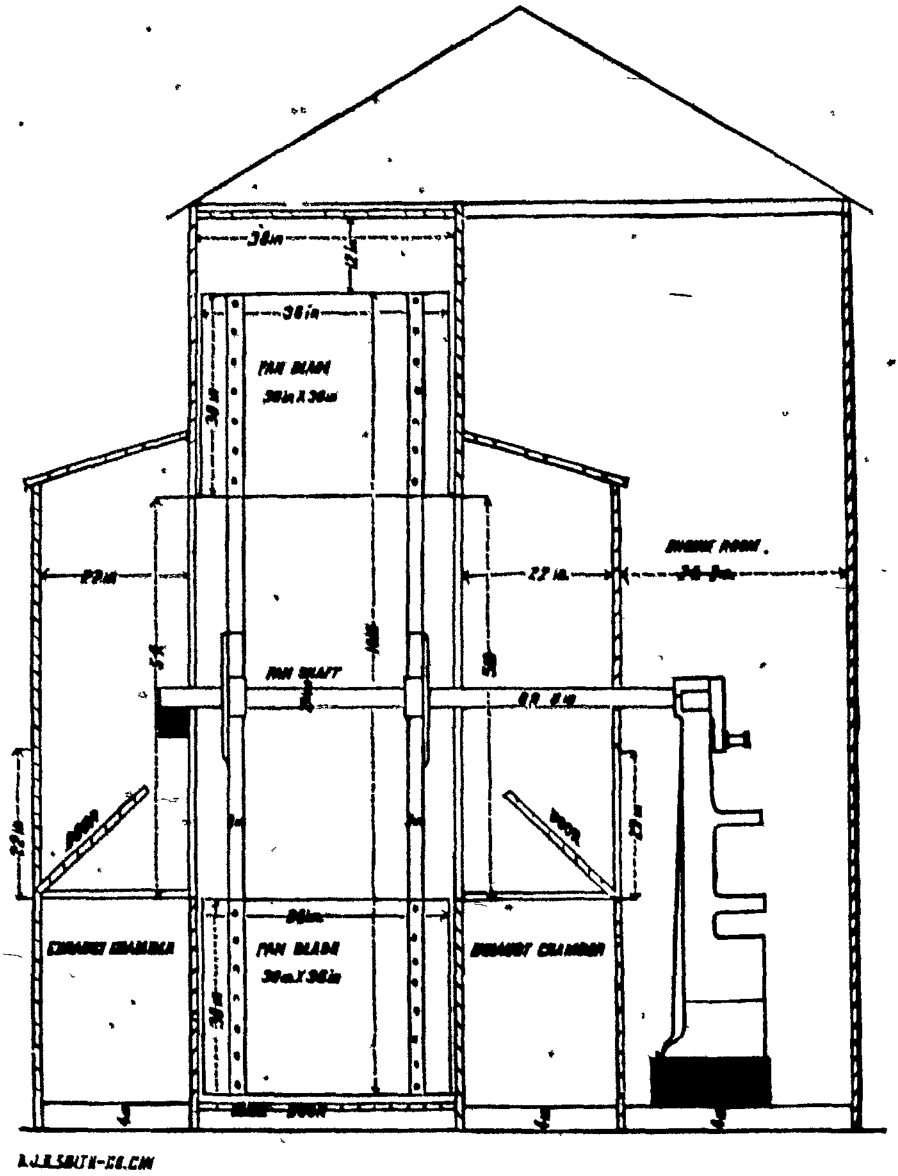
At shaft mines the fan casing should be so made and provided with doors and slides, that the current may be quickly reversed. By this means the shafts may be cleared of ice in cold weather, and in case of a fire at the down-cast, the current can be reversed, and the smoke and gases from the fire prevented from entering the mine. This might be accomplished by stopping the fan, but if the mine is a fiery one there would be great danger of fire-damp accumulating.

The relative capacities of different sized fans, as claimed by some makers, are shown in the following table, but these results are not generally obtained in actual use. The quantity of air obtained varies greatly with the sizes, lengths, etc., of the air-ways.

Diameter of Fan Wheels.	Engine.		Revolutions per minute.	Capacity cubic feet.
	Diam.	Stroke.		
15 feet	10 inch	20 inch	20 to 80	100,000
12 "	8 "	13 "	20 to 100	65,000
10 "	6½ "	12 "	20 to 120	40,000
8 "	5 "	10 "	20 to 120	25,000
7 "	5 "	10 "	20 to 150	20,000



FAN HOUSE FOR REVERSING THE AIR CURRENT AT PLEASURE.



DIMENSION DRAWING FOR FAN AND ENGINE HOUSE

NOTE. The cuts here shown are of a fan made by Crawford & McCrimmon, of Brazil, Indiana. This is the fan mostly used in this State, except in the Mercer county mines, where a Pennsylvania fan, driven by a belt, is used. Wm. F. Cole, of Washington, Indiana, and the P. Hayden Saddlery Hardware Co., of Columbus, Ohio, also manufature fans.

DESCRIPTION OF THE MINES.

BROOKE COUNTY.

WELLSBURG SHAFT.

Is located on the Pittsburgh, Cincinnati & St. Louis R. R. at Wellsburg sixteen miles north of Wheeling. It was idle until March 12th when it was started under a lease by Mr. M. R. Smith & Co., but was operated only a short time. This mine has but one outlet, and when it began work, I notified the operators, requiring them to begin to sink another at once. On the 31st of May I visited and examined the mine. A fan ten feet in diameter had been erected for ventilation, (instead of the furnace formerly used,) a few days before, and the air was split into two currents for ventilating the workings. One of these currents measured 6,235 cubic feet and the other 5,940 cubic feet of air per minute, making a total of 12,175 cubic feet circulating per minute in the mine, a fair proportion of which was taken to the heads of the workings. Better doors were needed in the mine as fire-damp is given off, and those in use were of poor construction. I ordered that new doors be made and properly hung.

WELLSBURG MINE.

On the P. C. & St. L. R. R. a half mile below Wellsburg shaft, is operated by Forbes, Carmichael & Co. Ventilation is maintained by furnace which was passing 6,600 cubic feet of air per minute, but only 1,800 feet of this quantity reached the head of the workings. There were however only about twenty-two persons employed inside, and the ventilation was fair. The drainage was good. William Forbes, superintendent; J. W. M. Carmichael, mine-boss.

SHORT CREEK

Is located on the line of the P. C. & St. L. R. R. ten miles north of Wheeling. It is operated by James Cooper & Co. Natural ventilation is relied upon, but an air-course goes entirely through the hill; the mine is a small one, and the supply of air was good.

The drainage had been considerably improved, and was quite fair at the time of my visit. A difference occurred between the operators and their workmen here in February, and only two or three miners were employed between that time and the 1st of June. Joseph Cooper, superintendent; James Cooper, mine-boss.

OHIO COUNTY.

TOP MILL

Is in the northern part of Wheeling, and is operated by the Wheeling Iron & Nail Company. It is ventilated by furnace. Only fourteen miners are employed. Jos. M. Hamilton, mine-boss.

FULTON

Is operated by Marshalls & Van Fossen. Only eleven miners and two drivers were employed, and the mine was not inspected. Ira B. Van Fossen, superintendent and mine-boss.

ELM GROVE SHAFT

was visited February 13th, June 2d and August 26th. On my first visit it was found to be insufficiently ventilated, there being a little more than half as much air entering the mine as there should have been; the main door was leaky and the return air-way was partially obstructed with slate. I notified the superintendent to remedy these defects, and on my second visit the mine had been somewhat improved; at the time of my last visit there were only twelve persons employed inside, and no inspection was made. Four steam jets are used to maintain the ventilation, (though a small fan would be much better), and a steam syphon is used for drainage. It is operated by W. T. Chambers & Co. W. T. Chambers, superintendent; F. Martin, mine-boss.

CENTRAL GLASS HOUSE

Is operated by the Central Glass Company. From three to six miners are employed; and a furnace is used for ventilation.

MANCHESTER.

Is on Wheeling Creek, one-fourth mile below the Central Glass House mine, and is operated by the Manchester Coal Company. The ventilation was natural, but it was good throughout the working parts of the mine. There are rarely as many as fifteen miners employed in the mine.

The Manchester mine known as "No. 2" has been idle about two years. R. J. Smyth, superintendent; James Young, mine-boss.

WHITAKER.

Operated by the Whitaker Iron Company, is also on Wheeling creek, next below the Manchester mine. It is ventilated by a fan ten feet in diameter, and the quantity of air was ample, measuring 9,880 cubic feet per minute at the fan, and 3,760 cubic feet per minute at the head of the workings; there being employed at the time 20 miners, 6 day-hands and 4 mules inside. The drainage was good. A part of the main entry has to be watered occasionally to avoid the dust. The old mine operated by the same company, employs only 5 miners and 1 driver, and was not inspected. N. E. Whitaker, superintendent; T. E. Kasely, mine-boss.

CRESCENT

Is operated by Kaseley & Brooks. It is nearly worked out and employs only 8 miners.

LA BELLE

Is operated by the La Belle Iron Works. It is ventilated by furnace, and both the ventilation and drainage were good. Not more than 12 miners were employed at the time of inspection. Christian Baker, mine-boss.

MARSHALL COUNTY.

BOGGS' RUN

was visited twice within the year. It has a furnace, and the ventilation was fair with an average of about 2,000 cubic feet of air passing per minute at the head of the workings. At the time of my last visit only 14 miners were employed. It is operated by the Boggs' Run Mining and Manufacturing Company. Philip Kunz, superintendent and mine-boss.

CRESAPS SHAFT

Is a new mine opened last winter, on the line of the Ohio River Railroad, twenty miles south of Wheeling. The shaft was sunk 48 feet deep to a seam about 4 feet thick, which lies about 84 feet above the Pittsburg seam at this point. At the time of my first visit only a few miners were employed in driving entries. On a subsequent visit they had abandoned the seam first opened, and were talking of sinking to the lower or Pittsburg seam.

The Ohio River Coal Mining Company were the operators.

MOUNDSVILLE SHAFT

Is operated by the Moundsville Coal Company, J. O. Brooke, superintendent; John Brooke, mine-boss. This mine was visited four times within the year; in February, June, August and November, and has generally been found in good condition. It is ventilated by a fan 10 feet in diameter. The average speed at which I found it running on these visits was 77 revolutions per minute, and the average quantity of air circulated was 16,633 cubic feet per minute. At the bottom of the down-cast the air is divided into two splits or currents nearly equal in volume, one of which ventilates Nos. 1 and 2 west butt entries and Nos. 1 and 2 face entries off the No. 2 butt entry, while the other ventilates the main entry and Nos. 2 and 3 butts, off the main entry. The mine gives off fire-damp, and on November 14th I found a small accumulation in the heads of a pair of butt entries that had been driven to the rise about 100 feet in advance of the last break-through and stopped. Directed the mine-boss to have a break-through put in near the heads of the entries, and not to stop such entries in the future without a break-through sufficiently close to the face to keep out the gas. I, last year, requested this company to sink another shaft as there was only one outlet to the mine. This has been done, and a new Crawford & McCrimmon fan, 15 feet in diameter, has been purchased and placed in position and will be put on in a short time.

MARION COUNTY.

WEST FAIRMONT SHAFT

Worked a little in the spring, but it has been idle nearly the whole year. It formerly gave off some fire-damp though on a careful examination, February 15th, I failed to find any indications of it in the mine. This, however, is no sign that gas will not again make its appearance. Fred. T. Martin is superintendent.

CENTRAL

Is operated by Oliver Jackson, on the B. & O., 1½ miles east of Fairmont. 11 miners and 3 day men are employed inside. Natural ventilation. 10 coke ovens are in operation.

AURORA.

This is a new mine, opened last spring by the Newburg Orrel Coal Company. It is situated on the east side of the Monongahela river, and on the line of the Fairmont, Morgantown & Pittsburg railroad, two miles from Fairmont. At the time of my visit, August 28th, the main entry had been driven in only about 300 feet from the outcrop, and the mine was dependent on natural ventilation. No incline is used, as the mouth of the mine is only 21 feet higher than the railroad track, and 75 feet from it. The Pittsburg seam is worked, and measures 7½ feet thick. Morgan D. Orr, superintendent; Joshua Harr, mine-boss.

MONTANA

Is also a new mine on the F., M. & P. R. R., five miles from Fairmont, and is operated by the Montana Coal and Coke Company. It was begun last summer and on November 13th, employed only 12 miners in driving entries. It is in the Pittsburg seam, here measuring 7 feet in thickness and appearing to be unusually free from impurities. Twenty coke ovens are completed, and the company contemplates building 80 more. J. E. Watson, superintendent; Cornelius Gaskill, mine-boss.

PALATINE

Located on the B. & O. railroad, one and a half miles east of Fairmont, is operated by the Newburg Orrel Coal Company. This is one of the oldest mines in this part of the State, having been opened by the B. & O. R. R. Co. in 1852. The ventilation was natural and fair, though as a result of drawing pillars some of the air-ways had been partially closed, making the ventilation not so good in a part of the mine as was desirable. The drainage was good. The seam measures eight feet in thickness, of which six to twelve inches are left overhead, and make an excellent and comparatively safe roof. M. D. Orr, superintendent; James Kinney, mine-boss.

GASTON

Is on the West Fork of the Monongahela river, one and a half miles from the B. & O. R. R., with which it is connected by a standard gauge railroad. It was formerly worked on the single entry plan, but they are now changing it to double entry for the purpose of better ventilation. Instead of the steam jets formerly used for ventilation, a fan, twelve feet in diameter, has been substituted, which, at 60 revolutions per minute, circulated 14,400 cubic feet of air per minute through the mines, and the ventilation was good. W. B. Brooks, Esq'r, formerly superintendent of the Moundsville shaft mine, was employed by this company last summer and when I was last at the mine he was making several improvements. Under his management, I believe that this mine will always be found in excellent working order. It is operated by the Gaston Gas Coal Company. J. E. Watson, superintendent; W. B. Brooks, mine-boss.

NEW ENGLAND

Is located on the east side of the West Fork river, directly opposite the Gaston mine, and was operated by the New England, Fairmont and Western Gas Coal Company; but it has not run any since last spring.

PRESTON COUNTY.

IRONDALE

Is operated by F. Nemegyei, and is located near the line of the B. & O. R. R., ten miles east of Grafton. It is a slope mine and did but little till late in the spring, when the force was increased. The old workings of this mine on account of the want of proper air courses and the insufficient pillars left, became unsafe and were abandoned last winter, and a new slope opened. At the time of my first visit, June 25th, an airway had been driven from the foot of the new slope, into a part of the old workings, so as to connect with an old air shaft and furnish a return airway. At the bottom of this shaft a large heating stove had been placed temporarily, to assist the ventilation. The plan of working adopted at the new slope would have been a difficult one to ventilate when the workings would become extensive, and I directed that it be changed, a new air shaft sunk and a furnace or a fan used to ventilate the mine. On the 2d of September, I again visited this mine, and found the plan of working changed and the air shaft sunk as directed, but no fan or furnace had been provided. The ventilation however was fair at the time. R. S. LaRue is the mine-boss.

MOUNTAIN BROOK SHAFT.

This is the mine in which the fatal fire-damp (carburetted hydrogen gas) explosion occurred on the 21st day of January. It is located on the Baltimore and Ohio railroad at Newburg, 13 miles east of Grafton, and is operated by the Newburg Orrel Coal Company. An account of the accident is given under the head of "fatal accidents." At the time of the explosion the directions that I had given for improving the mine had not been followed and I again notified the operators, required the additional shaft to be sunk and the system of working to be so changed as to secure more reliable ventilation. Sometime afterwards the work of cleaning up the mine preparatory to resuming operation, was begun, and John Hogg Esq., of Steubenville, Ohio, employed as superintendent, and Richard Dunne, as mining-boss. The fan has been put up, the system of working has been changed, they are sinking the escapement and air-shaft, and the mine is worked exclusively with safety lamps. I have visited and examined the mine five times since the explosion, The superintendent appears to be an experienced and a careful man. The mine generates a good deal of fire-damp at times, and care and rigid discipline should constantly be enforced. The fan is a Crawford & McCrimmon, 10 feet in diameter, but neither the fan nor the sectional area of the up-cast, is large enough for a large working force in the mine, and I directed that not more than 20 miners be permitted in the mine at one time, until the escapement and air shaft which they are sinking, can be completed. They now work two shifts, of 20 miners and the necessary day hands each, so as to get the required out-put of coal. A part of the mine is inclined to get dusty, and as coal dust is known to be a powerful agent in explosions, I have directed that it be kept wetted down. On my last visit November 12th, 33 coke ovens were in operation, and they were building 70 more, 35 of which they expected to complete by January 1st.

NEWBURG.

These mines were operated by the same company that operates the Mountain Brook shaft, but they are about worked out, and early in the summer there were only a few miners employed in drawing pillars.

AUSTEN.

Is operated by Colgate and Company on the line of the Baltimore and Ohio railroad, sixteen miles east of Grafton. The ventilation is natural generally, but sometimes a small furnace is used. On the day of my visit the furnace was not in use, but a fair volume of air was passing through the mine and the ventilation was good. An airway goes from the workings to the out-crop on the opposite side of the hill from the mouth of the mine, furnishing two outlets and making natural ventilation much better than it would otherwise be. The coal is of good coking quality, and the company owns 65 coke ovens at the mine. C. Jessop, superintendent; J. M. Whittaker, mine-boss.

MINERAL COUNTY.

ARMSTRONG.

Is located on the West Virginia Central and Pittsburg railroad, nine miles from Piedmont, and is operated by the Big Vein Coal Company. It is worked in the Cumberland or George's Creek seam of which the company originally owned about 80 acres at this point, averaging fourteen feet in thickness. No powder is used in the mine, the coal being all won by pick and wedge. The condition of the mine was found to be very fair. It is ventilated by natural means. James Little, superintendent and mine-boss.

ATLANTIC.

Is operated by the Atlantic and George's Creek Consolidated Coal Company, and is located about three miles from the Armstrong mine. The ventilation is natural and in parts of the mine is was poor. The air-courses had not been kept up properly with the workings, and some of the working-places were too far ahead of the air. An air shaft was sunk to the second left butt heading and completed in July, but the quantity of air entering it was not sufficient for the number of persons employed inside. The main entry was nearly through to the opposite side of the hill from the mine mouth, and the mine-boss promised to drive it through as early as possible. I ordered the air courses to be hurried up, and working in advance of the air to be stopped. L. T. DeWitt, superintendent; John Jose, mine-boss.

ELK GARDEN, NO. 1.

Is operated by the West Virginia Central & Pittsburg Railroad Company, on a branch of said railroad, thirteen miles from Piedmont. It is ventilated by a furnace 5½ feet wide, 5 feet high from bars to arch, and with 44 square feet of grate surface. The volume of air found entering the furnace measured 17,000 cubic feet per minute, but the ventilation in a part of the mine, especially near the heads of Nos. 4 and 5 right butt headings, was not so good as was desirable, owing chiefly to defective doors and the want of boys to keep them closed. The plan of working at the mine is to drive the narrow work entirely through the coal; after which the rooms are turned and driven 14 feet wide, with ribs or pillars from 28 to 30 feet thick between them. When the rooms are driven up the pillars are attacked first at the heads of the butt entries, and removed, letting in the super incumbent strata. By this method a large per cent. of the coal is gotten, and the dangers of squeezes avoided. A. C. Rawlings. superintendent; Isaiah Fenton, mine-boss.

ELK GARDEN, NO 2,

Is operated by the same company that operates the No. 1 mine, and is about one mile east of it. The entries here are nearly all driven through to the out-crop, and the same general plan of working in use at the No. 1 mine is also followed here, and nearly all of the coal is removed. The roof is good and with proper timbering is quite safe. The condition of the mine, both as to ventilation and drainage, was good, though the former was dependent on natural causes. A. C. Rawlings, superintendent; John Nesbitt, mine-boss.

TUCKER COUNTY.

ELK GARDEN, NO 4,

Has employed not more than 10 miners at any one time within the year. It was closed July 10th, and will probably not be opened again until next spring.

DAVIS

Is operated by H. G. Davis & Brother, and is located on the W. Va. C. & P. Ry., fifty-seven miles from Piedmont. This mine was not in good condition either as to ventilation or drainage when I examined it. I directed the superintendent to put the mine in order. The operators have since written me that the defective damage and ventilation have been remedied, and that the mine was in good order. James Brown, superintendent and mine-boss.

TAYLOR COUNTY.

FLEMINGTON

Has not been in operation this year.

TYRCONNEL, NOS. 1 AND 2,

Are on the Parkersburg branch of the Baltimore and Ohio Railroad, eleven miles west of Grafton, and are operated by the Newburg Orrel Coal Company.

They are worked in the Pittsburg seam, averaging eight feet in thickness. The ventilation of both mines is natural, and in the No. 1 mine it was good; but in the No. 2 mine it was only fair. The drainage of both mines was good. The company has 25 coke ovens in operation at these mines. J. H. Henry, superintendent; Robert Love, mine-boss.

HARRISON COUNTY.

OCEAN

Is on the Parkersburg branch of the B. & O. R. R., and is operated by the Consolidated Coal Mining Company. It was visited February 17th, June 30th and September 7th. At the time of my first visit the ventilation was poor, and they were sinking an air-shaft to a point near the head of the mine entry for the purpose of improving it.

At the time of my second visit the air-shaft was down about sixty feet, and they had driven perpendicularly upwards thirty feet from the inside of the mine to meet the section of the shaft that was being sunk; but an error had been made in locating the points, and a tunnel or slope was necessary to connect the sections of the shaft before it could be made available for ventilation. On my last visit the connection had been made; a much needed air-course was being driven, and the ventilation had been considerably improved. It will, however, take some time to get the mine in proper shape. R. D. Wilson, superintendent; W. W. Fowler, mine-boss.

DESPARD,

Located two miles east of Clarksburg, on the Parkersburg branch of the B. & O. R. R., is operated by the Despard Coal Company. It was found in good order, both as to ventilation and drainage. It is dependent on natural causes to produce a draught, but I found 14,400 cubic feet of air entering the mine, and a fair share of this quantity was found at the head of the workings. The mine-boss, John Latstetter, Esq., appears to be very considerate of the welfare of his workmen, and accidents are rare. Eighteen coke ovens are in operation here. Mord Lewis, superintendent.

HARRISON COUNTY MINE

Is at Clarksburg and is operated by the Harrison County Coal Company. The ventilation was fair, but the drainage was not good at the time of my visit.

PINNICKINNICK

Is located at Clarksburg and operated by T. P. Brannon & Company. This company is composed almost entirely of eight or ten miners who leased this mine and began operations in a small way, in the summer of 1885. They appear to be making a success of the enterprise, and there are now employed about 25 miners in addition to the company; or a total of about 35 miners. The condition of the mine was good, with natural ventilation. T. P. Brannon, superintendent; Patrick Laughney, mine-boss.

FARLAND'S,

Is a small mine at Clarksburg, operated by J. T. Farland. From 6 to 10 miners are employed, and 18 coke ovens are in operation at this mine.

WILSONBURG,

Is on the Parkersburg Branch of the B. & O. R. R., three miles west of Clarksburg. This mine was closed in April, 1885, and was idle from that time until the first of last March, when it was purchased and re-opened by the Howard Coal and Coke Company, by whom it is now operated, The ventilation was natural, but good. I measured 3,500 cubic feet of air passing per minute. Number of persons employed inside, 23; and 30 coke ovens are in operation. John Temple, superintendent and mine-boss.

MASON COUNTY.

NEW HAVEN

Is operated by Hugo Juhling, and is at the upper end of New Haven, on the Ohio river. It was visited May 29th and August 21. The ventilation was good at both visits. At the time of my first visit the drainage was poor, but it had been considerably improved when I was last at the mine. The exhaust steam from the pump at the foot of the slope was discharged into a sump for the purpose of condensing it, and the result was a misty vapor at that point, which was disagreeable, and difficult to see in. I ordered piping to be put in, so as to carry off the steam. Ventilation is by furnace, and I found 12,000 cubic feet of air entering it per minute. Hugo Juhling, superintendent; Wm. Goodnite, mine-boss.

HARTFORD CITY

Is operated by the Hartford City Coal and Salt Company, and is ventilated by a furnace which was passing 5,400 cubic feet of air per minute when I was in the mine. The air current was weak in a part of the mine, but the air was generally good. The out-put is used at the Hartford City Salt Furnace, and to supply the local demand. Thos. E. Jones, superintendent and mine-boss.

CALIFORNIA

Is a slope mine near Hartford City, and is operated by the Juhling Coal Company. It was idle from the 5th day of June to the 3d of November, when it was re-opened. The ventilation was moderately good, and is maintained by a fire on an iron grate at the bottom of a shaft on which is a board stack. I measured 7.500 feet of air passing per minute near the bottom of the shaft. The drainage was fair. Wm. Juhling, superintendent; Jas. McKee, mine-boss.

SEHON.

Examined this mine in May, and found it in poor condition. A large part of the workings was too far in advance of such ventilation as they had, and in thsoe parts of the workings that the ventilation reached, it was so weak as to be barely perceptible with an open light; and in almost every part of the mine the drainage was neglected, and about on a par with the ventilation. There is a ventilating furnace at the mine, but the absence of proper air-courses and stoppings, rendered it of but little effect. I immediately served a written notice on the operators, requiring them to proceed at once to put the mine in order. I further informed them that unless immediate attention was given the matter, I would present the case to the next grand jury of the county, Visited it again in about two months, and found it idle. I was at the mine again November 17th but the number of miners employed at that time was not large enough to make the mine subject to the Mining Act. I was, however, informed that an air-shaft had been sunk, and the ventilation improved. It is operated by C. A. Bettinger & Co. Peter Bettinger, mine-boss.

MOSQUITO

Located a half mile below Hartford City, is operated by the Liverpool Salt Company It is ventilated by a small fuonace, which was passing 3,120 feet of air per minute. Tqe ventilation was only fair, being very weak at the head of the workings. They were employing 16 miners, 2 drivers, and 1 track-layer. inside. The company is re-opening an old mine nearer their salt furnace. Charles Clifton, superintendent; Jacob Lillich, mine-boss.

GERMAN FURNACE.

Only 13 miners are employed, and I was informed that they have never employed more than that number at one time, and do not expect to do so in future. It is operated by the German Coal and Salt Company. C. R. Young is the mine-boss.

HOPE.

Located at Mason City, is operated by the Hope Coal and Salt Company; Ed. Edwards, superintendent; D. Thomas, mine-boss. There is an air shaft at the head of the main butt entry off which all the rooms are turned that were working, and the quantity of air entering the bottom of this shaft measured by anemometer 3,100 cubic feet per minute. Ventilation natural, but both it and the drainage were good. The mine is a small one.

STERLING.

Is at the upper end of Clifton on the Ohio river. and is operated by W. E. Edwards, who is also superintendent. The old opening and main entry to this mine were abandoned last winter on account of the difficulty in keeping them well-drained, and a new opening made. It was in fair working order; both the ventilation and drainage have been much improved since a former visit.

CLIFTON,

Operated by the Maxwell Manufacturing Company, is on the Ohio river, opposite Middleport, Ohio.

This mine has a ventilating furnace, but natural ventilation is sometimes used. At the time of my visit there was little fire in the furnace, but I found 2,500 cubic feet of air entering it per minute, and 20 persons employed inside the mine. On the main entry 8,000 cubic feet of air was passing per minute, produced by natural causes alone. The ventilation was good, and the drainage fair. Anthony Robson is superintendent and mine-boss.

NEW CASTLE.

This mine was operated by W. E. Edwards last winter, but it was closed about the last of February and has since been idle,

CAMDEN

Is operated by the Consolidated Coal and Mining Company. It is located on the Ohio river, one and a half miles from Clifton. At the time of my visit November 19th, it was just starting up after an idleness of several monhts for want of shipping facilities due to low water in the Ohio river, and all the miners had not yet returned to work; there being only 15 employed at the time. It was well ventilated by a furnace 4½ feet wide, 3 feet high from bars to arch, with shaft 33 feet deep and 5 feet diameter. At the top of the shaft an old iron boiler shell is used as a stack. The velocity of the air near the furnace was 215 feet per minute and the sectional area of the air-course 60 feet, making 12,900 cubic feet of air per minute. The average quantity of air at the heads of the workings measured 4,180 cubic feet per minute. Geo. Bushears, superintendent; John Gosney, mine-boss.

PUTNAM COUNTY.

ENERGETIC

Located on the Kanawha and Ohio railroad, twenty miles below Charleston, is operated by the Energetic Coal Company. The ventilation was natural and was tolerably fair. The mine is near the Kanawha river, but shipments are made only by rail. D. L. Anderson, Jr., is mine-boss. Only 15 miners were employed.

STAR.

Very little has been done at this mine within the last eighteen months. It was closed about the last of June, 1885, on account of low water in the Kanawha river cutting off shipping facilities, and owing to a difference between the company and the miners in reference to the price to be paid for mining, operations were not resumed until about the 15th of last June. It was again stopped on account of low water about the 10th of August, and was re-opened about the 15th of November. I visited the mine November 17th. It is ventilated by an excellent furnace 6 feet across the bars, 4½ feet from bars to arch, 2½ feet from bars to hearth and 8 feet long, at the bottom of a shaft 50 feet deep on top of which is a stone stack 15 feet high. Shaft and stack each 6 feet inner diameter. It is well attended and was passing 22,680 cubic feet of air per minute. This quantity is the result of two currents nearly equal in volume, one of which ventilates Nos. 1. 2, 3 and 4 butt entries; the other, Nos. 5, 6. 7, 8, 9 and 10 butt entries. The drainage and ventilation were generally good, but in several places the ventilation was defective. As the mine had just started after a long idleness, the mine-boss claimed that he had not had sufficient time to repair his doors and stoppings and clear the air-courses of fallen slate, but he promised to do so without delay. This mine formerly shipped only by Kanawha river, but the company is now building a tipple on the Kanawha and Ohio railroad. It is operated by the Marmet Mining Company. George W. Cawley is the superintedent and John W. Good is the mine-boss.

KANAWHA COUNTY.

BLACK BAND.

Is operated by the Black Band Iron and Coal Company and is at the terminus of the Kanawha & Coal River railroad, about 14 miles from Spring Hill on the Chesapeake and Ohio railroad.

Originally there were two mines here, each one having a separate furnace for ventilation. Since the workings were connected underground, the entire mine has been ventilated by one furnace. The ventilation was good. I measured 9,600 cubic feet of air per minute at the furnace, and a good part of this quantity was taken to the heads of the workings. A large part of the mine has a strong sand stone roof which requires but little timbering and is very safe. About a half a mile from this mine the company is opening a new mine in the same seam. Drainage was fair A. M. Woolridge, superintendent; John Casey, mine-boss.

BEANE'S,

Is on Compbell's creek, 5 miles above Charleston. It is operated by the Welton Coal and Salt Company.

I visited this mine twice during the year and found it in fair order as to ventilation and drainage. It is worked by slope which is 330 feet long. Average quantity of air entering the furnace, 11,600 cubic feet per minute, at the times it was examined. In some of the workings however the ventilation was not as good as it should have been. The tipple of this mine was swept away by the high water April 3d. A new one was built and completed June 5th. Mike Beane is superintendent and mining-boss.

BOYCE

Has been idle nearly all the year. It began to run with a few miners late in November. When inspected November 27th, only 21 miners were employed and the mine was not yet in good working order. It is operated by the Campbell's Creek Coal Company.

CALDERWOOD

Is operated by the same company that operates the Boyce mine, and is but a short distance from it, on the opposite side of Campbell's creek. It is ventilated by a furnace, near which I measured 13,630 cubic feet of air passing per minnte, and the air is well conducted through the workings. This mine has always been found in excellent order; in fact it has acquired a reputation for systematic working and thorough ventilation and drainage, which is not excelled by that of any other mine in the State. It is worked on the double-entry system, the air-courses are kept well up; the doors and stoppings are well made and kept in order, and the mine-boss, William Calderwood, Esq'r, is a competent and energetic man. This company is opening a new mine on Campbell's creek, nearly opposite the old Pioneer, No. 2, mine. The main entry was in about 300 feet on November 27th, and 8 or 10 miners were employed, all of whom were driving entries. J. E. Dana, superintendent.

DANA BROTHERS',

Located opposite the Calderwood mine, on Campbell's creek, is operated by Dana Brothers. The ventilation was generally good, except near the foot of the slope, an entry had been turned to the left and driven in some distance and several rooms turned, without an air course. The drainage was defective in part of the mine. The mine has an excellent furnace, which was circulating 20,100 cubic feet of air per minute. George Dana is superintendent, and J. B. Lewis is the mine-boss.

PIONEER, NO. 4,

Is a new slope mine which was opened in the summer of 1885. It is located on the Coal fork of Campbell's creek, and is operated by the Pioneer Coal Company. The slope is 135 feet long and dips one foot in three feet. It is ventilated by a force fan, 8 feet in diameter, which was erected last May. The volume of air at the bottom of the down-casts was 14,800 cubic feet per minute, (speed of fan, 90 revolutions per minute,) and the average volume of air at the heads of the workings was 9,160 cubic feet per minute. Entries are driven 8 feet wide, rooms 25 feet wide with pillars 15 feet broad between them. The mine was in good working order. The old Pioneer mines, Nos. 1 and 2 were worked out and abandoned last winter. J. J. Lovell, superintendent; T. J. Brown, mine-boss.

DICKINSON'S

Is on the Kanawha river, a short distance above Malden, and is operated by John Q. Dickinson & Co. Only 14 men are employed.

BENNINGTON,

On Kanawha river, about 2½ miles above Malden, was operated by

W. S. Carkin. It ran a little last winter, but it has done nothing since March 12th.

WINIFREDE, NOS. 1, 2 AND 3.

These mines are operated by the Winifrede Coal Company, and are on the headwaters of Field's creek, 5½ miles from Winifrede Junction on the C. & O. Ry. Each one has a ventilating furnace.

In the No. 1 mine, the air current measured at the furnace 10,240 cubic feet per minute, and the ventilation was good, but it was weak on the No. 3 butt heading. This could be remedied by putting up a new door and the mine-boss promised to put it in without delay. The drainage was not very good in a part of this mine.

In the No. 2 mine, I measured 11,400 cubic feet of air per minute at the furnace, and both the ventilation and drainage were good; much better than in No. 1.

The No. 3 mine was doing but little when I was in it, and the furnace was only partially fired up; still it was giving 8,700 cubic feet of air per minute, and I believe it would easily have doubled this quantity with a good fire. So well were the doors and stoppings fitted in, that of the quantity (8,700 cubic feet) found at the furnace, I measured 7,300 cubic feet passing per minute at the heads of the workings. All the entries are driven double, the furnace is well constructed, and the whole mine was in excellent condition. R. B. Cassady is superintendent, and James Morgan is mine-boss.

BLACK DIAMOND

Is on the north side of Kanawha river, opposite Winifrede Junction. It is operated by the Black Diamond Coal Company. Ventilation natural, and only tolerably fair. Drainage not good in a part of the mine. The mine-boss promised to fix up his doors and otherwise improve the ventilation, and to pay more attention to the drainage. The mine was then operated by the Macfarlane Coal Company. I have not visited it since the change in the management, but I have heard that its condition has been improved. William Sharpe is superintendent.

PEERLESS

Is operated by the Peerless Coal Company.

On my first visit to the mine within the year, the ventilation was poor and the drainage was badly in need of attention; there being a good deal of water on the roads, especially on the No. 3 right butt heading, which was very wet and muddy. I notified the superintendent and required that immediate attention be given to improving the condition of the mine, and that some adequate means of ventilation (a fan or furnace) be provided. Shortly after this a fan of 7 feet in diameter was erected, and at the time of my last visit the air-current at the fan measured 12,400 cubic feet per minute, and both the ventilation and drainage had been much improved. H. S. Hallwood, superintendent; Joseph Moore, mine-boss.

STEVENS' COAL COMPANY

Is on a branch of Cabin creek, at the terminus of the Kanawha Railroad, 10 miles from Coalburg.

The main entry is driven double or with parallel air-course, and the butt entries are single. A break through which was nearly completed near the head of the main entry, and one or two doors across the mouths of rooms were needed. With these improvements the ventilation would have been moderately good throughout the mine, and I directed them to be made. A small ventilating furnace is used, which was passing 7,400 cubic feet of air per minute. F. L. Garrison is superintendent, and John S. Holmes is mine-boss.

COALBURG, NOS. 1 AND 2,

Are operated by the Robinson Coal Company.

Both mines are dependent on natural causes for ventilation. In the No. 1 or large mine the ventilation was insufficient, and at the heads of the workings it was very weak. Natural ventilation can frequently be made good in mines so situated that numerous openings can be made to the out-crop, and the different sections of the mine aired by separate currents; but in large mines, unless this can be done, or wherever a large number of miners depend on one current for air, natural ventilation will without exceptions become insufficient at times, especially in the warm seasons, and should not be relied on. I notified the company of the condition of the mine, and required that a furnace or some other artificial means of ventilation be provided. This has not yet been done, but the superintendent wrote me under date of December 21st, that they fully expect to have a fan in operation before summer. The system by which the mine is worked is a good one, and with some means of creating a draught the ventilation would be good.

In the other mine, known as the "Blackberry" mine, the ventilation was good, with 3,360 cubic feet of air in circulation; and 28 persons were employed inside. Neil Robinson, superintendent; Robert Brabbin, mine-boss.

NORTH COALBURG,

Located on the north side of Kanawha river, opposite Coalburg, is operated by the Lovell Coal Company, and is worked in a seam about 250 feet above the Coalburg seam at that point. Ventilation is natural, but it is sometimes assisted by a fire at the bottom of a shaft. It is worked on the double entry system, and with a good furnace the ventilation would be ample. The drainage was fair, though the whole mine is inclined to be damp. The old mine in the Coalburg seam, was abandoned several years ago, but there is talk of re-opening it. R. C. Lovell, superintendent; David Harvey, mine-boss.

PEABODY,

On the north side of Kanawba river, about one mile above the North Coalburg mine, is operated by the Peabody Coal Company.

At the time of my visit to this mine, operations were just beginning after several months of idleness, and it was not in good condition. Ventilation is maintained by furnace, but it was insufficient especially on the No. 3 butt entry where a door was needed to improve it. The mine-boss promised to put the mine in order as early as possible. Geo. W. Connell, superintendent; J. J. Neylon, mine-boss.

CEDAR GROVE

Is operated by the Cedar Grove Mining Company. Ventilation is partly natural and partly by furnace. At the time of my visit, a squeeze had closed some of the air-courses in that part of the mine ventilated by furnace, and the result was poor ventilation in some places. In those portions of the mine not affected by the squeeze, the ventilation was fair. They were at work cleaning up the mine and opening up air-courses, so as to restore the ventilation. J. G. W. Tompkins, superintendent; P. S. Banister, mine-boss.

EAST BANK,

Located one and a half miles from Coalburg, is operated by Stuart M. Buck. The ventilation of the mine, so tar as it was worked, was good; the air-current being produced by furnace power. The drainage was good. An opening has been made by Mr. Buck in the Cedar Grove seam, but at the time of my visit only 7 or 8 persons had been employed in it. Stuart M. Buck, superintendent; G. W. Poff, mine-boss.

BLACKSBURG

Was formerly operated by William Sharpe, but the management changed last winter, and it has since been operated by George B. Reynolds. A squeeze began in this mine last winter, and has given a good deal of trouble. They were making a new opening about 500 feet east of the old one, when I was at the mine, and the main entry was in about two hundred feet from the out-crop. The mine was ventilated by a fire basket at the bottom of a shaft, but the air was not conducted in sufficient volume to the head of the workings. Geo. B. Reynolds, superintendent; D. G. Lowther, mine-boss.

KELLY'S CREEK,

Located on the north side of Kanawha river, opposite Blacksburg mine, is worked in the Cedar Grove seam. It has a small furnace and the ventilation appeared to be quite fair, though there was but little fire in the furnace, as they were doing very little in the mine at the time. The drainage was good. It was operated by the Cedar Grove Pure Coal Company. J. G. Durbin, superintendent; John Thompson, mine-boss.

CROWN HILL

Is operated by the Crown Hill Splint Coal Company. Ventilation is by furnace and was fair. In some places, new doors and stoppings were needed by which the ventilation could have been made very good. The workings of this mine are now quite extensive, and the long distance that the air has to travel causes considerable friction. The mine-boss is driving to the out-crop at a point which will considerably lessen the distance. A proper system of splitting the air would greatly assist the ventilation here. The drainage was very good. Important improvements have been made in the facilities for handling coal at this mine, within the year. A new railroad tipple has been built, and the old river tipple which was swept away by high water, March 31st, has been replaced by a new truss tipple. Brewer Smith, superintendent; J. D. Lowther, mine-boss.

WACOMAH

Is located on Paint creek, 5 miles from Paint Creek station on the Ches. and Ohio railroad. Much trouble was experienced here in the spring, on account of a fire that has existed in the coal seam at the mine for a number of years. Until lately the fire was confined to a small area on the right hand side of the main entry near the mouth of the mine, and was sealed off from the workings. Hearing that it had broken into the main entry last spring, I immediately visited the mine to see that proper precautions were taken against the deadly gases that emanate from such fires. On reaching the mine, I found that all the miners had been withdrawn from the workings except a few that were fighting the fire.

Formerly a furnace had been used for ventilation and the main entry as the intake, but the furnace had been abolished and they were erecting a steam fan, so as to reverse the former direction of the air-current, make the main entry the out-cast, and drive the gases from the fire out of the mine without their passing through the workings. Visiting the mines again, August 19th, I found the fan up and working successfully, and they were still trying to extinguish the fire. H. W. Reynolds, superintendent; Wm. R. Hall, mine-boss.

KANAWHA

Is located on the line of the Ches. & Ohio Railroad, one and a fourth miles below Coal Valley, and is operated by the Kanawha Mining Company. It was visited twice within the year. On my first visit several of the working-places were found entirely too far in advance of the break-throughs and the ventilation in such places was of course poor. I ordered the break-throughs to be made without delay. On my last visit, I found 8,840 cubic feet of air entering the furnace per minute, while the average quantity at the heads of the workings was 1,990 cubic feet per minute. The company has made an opening in the Coalburg seam here (which lies 86 feet above the seam worked at present,) measuring four feet and ten inches in thickness. They have also graded a tram-road 1,400 feet long, to this new opening with the intention of working it. G. L. Drouillard, superintendent; James Youell, mine-boss.

UNION

Is operated by the Union Coal Company and is about one-fourth of a mile from the Kanawha mine. It has a small furnace which was not fired up when I was in the mine, as they were running but very little coal. The ventilation however was fair from natural causes and the drainage was good. They are driving through from the head of the main entry to the out-crop on the back side of the hill. When this is through it will shorten the airway and considerably improve the ventilation. The lower mine in the gas seam, has not been operated for about eighteen months. They have lately cleaned it up with the intention of working it this winter if the trade improve sufficiently. Edward Pinkney, superintendent and mine-boss.

CANNEL,

Is located on the north side of Kanawha river, opposite Coal Valley, and is operated by the Cannelton Coal Company. A large part of the coal that they are now working at this mine, consists of pillars and blocks or sections of coal that were left years ago in the first working of the mine. The ventilation is natural and in some parts of the mine it was poor. In one place this was caused by the closing of an air-way by a squeeze and in another, by the want of an air-way which they were driving to the outcrop; but which should have been driven and opened before any rooms were turned in that part of the mine. The drainage was not good. Henry Davis, superintendent; Thomas Elliott, mine boss.

MOUNT MORRIS

Was visited March 10th and July 15th. The quantity of air in circulation was not found sufficient at either visit. I directed the superintendent to provide a fan or furnace to maintain a draught of air, but at the time of my latter visit, it had not been done and natural causes were still relied on for ventilation. From 50 to 60 persons are usually employed inside. It is on the Morris Creek Branch of the Ches. & Ohio Ry. The Mount Morris Coal Company operates the mine. William Trudgen, superintendent; E. O. Edwards, mine-boss.

EXCELSIOR

Was closed August, 1885, and re-opened on the 30th day of last June. I examined this mine July 15th, and found 7,000 cubic feet of air entering the furnace and 30 persons employed inside, but the air was not taken to the heads of the workings for want of proper air-ways, and in a part of the workings the ventilation was poor. I directed that the mine be put in order. On a subsequent visit a much needed air-course which they were driving when I was in the mine before, was through, brattice had been put up, and the ventilation was very much improved. They were also putting on a new furnace stack, the old one having been burned a few days before. The drainage was good on both visits. M. T. Davis & Co., are the operators and the mine is situated on the Morris Creek Branch of the Ches. &. Ohio Ry. M. T. Davis, superintendent; W. C. Wolf, mining-boss.

FAYETTE COUNTY.

EUREKA

Is near the Excelsior mine and is operated by the same company. Furnace ventilation is used, and I found 10,540 cubic feet of air in circulation per minute, and the measurements at the heads of the butt entries averaged 4,730 cubic feet per minute. The inside employes were 56 miners, eight drivers, two trappers and two track layers. The ventilation and drainage were good. M. T. Davis, superintendent; George Frazier, mine-boss.

CARVERS'

Is also on the Morris Creek Branch of the Ches. & Ohio Ry. It is operated by Carver Brothers. A fire-basket at the bottom of a shaft 55 feet deep with a stack 32 feet high is used to supply ventilation, and here the volume of air measured 9,570 cubic feet per minute, but the mine was not well ventilated. Rooms were driven too far without break-throughs and in one place a door was needed where there was not any, to conduct the air through one of the butt entries. The drainage was good. I directed that proper break-throughs be made, the door put up and the mine kept in order. John Carver is the superintendent, and John Tasker is mine-boss.

STRAUGHAN'S

Is situated at Coal Valley and operated by the Straughan Coal Company. When first visited July 13th, the ventilation was defective, especially near the head of the third left butt entry where the air was poor. At this place the air could have been improved by driving a short air course and puttting up a door and I ordered it done, and some bad slate taken down on the main entry. The furnace was giving 5,040 cubic feet of air per minute on my first visit, but on a second visit it was not fired up, and they were doing but little in the mine. George Straughan, superintendent; John Straughan, mine-boss.

COAL VALLEY

Is one of the oldest mines in Fayette county. Since they have been drawing pillars in this mine and breaking over-lying strata more or less trouble has beeen experienced from water, and on some of the haul-ways the drainage was not good. The miners' working places were however well drained. There are several outlets to the mine, the ventilation was produced by natural causes and it was good; the most of the working places being close to the air-way. The Coal Valley Coal Company operates the mine. T. P. Davis, superintendent; Matt. Perry, mine-boss.

CRESCENT,

Operated by William R. Johnson, is one mile from Coal Valley. Not much fire was in the furnace when I was in this mine, as but few men were in. Much more attention is paid to keeping up the air courses here than is usual in the vicinity of Coal Valley. The mine has a good furnace and appearances indicated that the mine was well ventilated, well drained and well managed. The system of working is partly single and partly double entry. Entries are driven nine feet wide, and rooms are turned 70 and 140 feet apart alternately from center to center, driven narrow 25 feet, and then widened to 21 and 28 feet. T. A. Bartlam, superintendent; John Perkins and Robt. Mason, mining-bosses.

FAULKNER'S, NOS. 1 AND 2,

Are operated by Frederick Faulkner. No. 1 is worked in the Eagle seam and No. 2 in the Coal Valley seam. In the No. 1 mine I found 5,600 cubic feet of air circulating per minute due to natural causes, and the ventilation was tolerably good, but the mine was not well drained. Seventeen miners were employed, and the mine running about half time. No. 2 when visited, June 16th, was found poorly ventilated, with many of the working places entirely too far ahead of the air. I notified the managers of the condition of the mine, directed that they give it immediate attention and put the mine in proper condition as early as possible; also that the working of rooms beyond the air be stopped. On a later visit, I found the mine better ventilated and drained, but some of the doors and stoppings were still very leaky, and not one-fourth of the air at the furnace (averaging 7,500 cubic feet per minute on both visits,) passed the heads of the workings. The mine-boss promised to go immediately to work and fix the doors and stoppings, and to thereafter, keep the mine in better condition. Frederick Faulkner is superintendent, and John Young is the mine boss of the No. 2 mine.

EAGLE

Was visited three times. I have always found this mine to be insufficiently ventilated whenever I have examined it, and generally poorly drained. Sometime after the furnace shaft of the mine was sunk, it was found necessary to wall it inside; in doing so, the diameter was reduced in some places, to less than three feet, and result is that the furnace is incapable of supplying a sufficient quantity of air. Usually from 50 to 100 persons are employed inside, and the average quantity of air found entering the furnace on several visits was 4,380 cubic feet per minute. At the heads of the workings the ventilation has generally been too weak to turn the anemometer and frequently it did not exceed 500 cubic feet of air per minute at such places. I have several times called the attention of the operator to the condition of this mine, and to the necessity of keeping open the two ways from the workings, (as the pillars left are not large and considerable trouble has been experienced from squeezes), so that one of them could be used for egress in case of the closing of the other, but the directions that I have given have at the most, been only partially followed. At the February term of the circuit court of Fayette county, I complained to the Grand jury of the condition of the mine and an indictment was found against the operator. Two terms of the court have been held since the term at which the indictment was found, both of which I promptly attended thinking that the case would be tried, but at both terms it was continued, and I have no idea when it will be tried. It is operated by William Wyant who is also superintendent; J. C. Bostic, mine-boss.

ST. CLAIR

Is operated by the St. Clair Company. It has a furnace for ventilation, but a few days prior to my visit (August 12th,) the furnace stack was burned, and it was not giving a sufficient volume of air when I was in the mine. I was informed that they had ordered brick to build a new stack which they intended to make about 30 feet high. The drainage was good. William Wyant, superintendent; Thos. Lloyd, mine-boss.

POWELLTON

Is on Armstrong creek four and three-fourth miles from the line of the Ches. & Ohio Ry., and is operated by The Mount Carbon Company, (limited.) W. N. Page, superintendent; J. W. Straughan, mine-boss. It is a new mine and the shipment of coal began last February. The Coal Valley seam is worked and shows seven feet eight inches of coal, but this is divided by parting or stratum of slate from four to six feet thick, into two layers of coal. The upper layer is four and a half feet thick, and it is the one principally worked, but the lower one is worked to a limited extent. The mine was in fair condition. On the 23d of November, sixty coke ovens had been completed and forty more were under construction.

GREAT KANAWHA

On my first visit, was found insufficiently ventilated. When visisted later the present superintendent had lately taken charge. The ventilation was tolerably fair and the drainage was good. A fire-basket was used and near it the volume of air passing measured 9,000 cubic feet per minute. I gave some directions for improving the ventilation, which the superintendent assured me would receive proper attention. The mine is operated by the Great Kanawha Colliery Company. The Coal Valley seam is worked. Thirty-six coke ovens are in operation. Symington McDonald, superintendent; S. Dixon, mine-boss.

HAWK'S NEST

Is operated by the Hawk's Nest Coal Company, and is located on a branch of Mill creek, three miles from Hawk's Nest Station on the Chesapeake and Ohio Railway. S. M. Taylor, superintendent; Robert Sampson, mine-boss.

It is worked on the single-entry plan, and the ventilation is natural except on the roadway for the mine locomotive, which has a furnace. The air was not good in a part of the workings. The company is now opening a new mine on the double-entry system, near the old mine and in the same seam. The superintendent informed me that he intends to build a good furnace, or provide a fan for the new mine, and if the system of working which he has adopted be followed, with a good fan or furnace, the ventilation can be made good. After the new mine is opened sufficiently, but few men will be employed in the old mine.

GAYMONT,

Operated by Joseph Pirrung, is on the line of the Chesapeake and Ohio Railway, one mile east of Hawk's Nest.

It has a furnace of sufficient power to supply the number of persons employed inside with air, but some of the working places were too far ahead of the air-courses, and of course the ventilation was not good in such places.

Ventilation measured 9,100 cubic feet per minute at the furnace. The drainage was good. Usually about twenty-five miners and six day hands are employed inside. Twelve coke ovens are in operation, and twenty more will be fierd up January 1st, 1887. Joseph Pirrung, superintendent; W. C. Daniels, mine-boss.

SUNNYSIDE

Is the next mine on the Chesapeake and Ohio Railway east of Gaymont mine. It is operated by Thomas & Lomax.

Its condition was only tolerably fair. The superintendent said that he would start an air-course to run parallel with, and follow the main entry; by this means the ventilation could be improved. The furnace was passing 4,500 cubic feet of air per minute, and twenty-five miners were employed. The superintendent is Edward Thomas, and James Lomax is mining-boss.

ELMS,

Operated by W. A. Burke & Co., is on the Chesapeake and Ohio Railway, three miles by rail east of Hawk's Nest, It is worked on the single-entry plan, and an intake and return air-ways were provided by making break-throughs in the room-pillars and placing doors usually of canvas across the mouths of all the rooms except the last with a break-through. Such doors are generally not close enough to prevent the greater part of the air from leaking through and escaping into the return. They now drive an air-way with the main entry, and the ventilation was much better than formerly. George Hamilton is both superintendent and mine-boss.

FAYETTE.

On my first visit a good deal of water was found along the haulways, and they were putting in a syphon. The volume of air circulated (which was due to natural causes), was not great enough to properly ventilate the mine with the number of persons employed. I notified the operators to drain the mine, and suggested the building of a furnace for ventilation. Visited the mine again September 13th. A small stack had been built, at the bottom of which a fire was kept for the purpose of creating a draught, but the mine was not in good order, and I again notified the operators to improve its condition.

It was operated by William Masters & Son until March 1st. Since that time it has been operated by Joseph Lawton & Company. George Lawton is superintendent; the mine-boss is William Stout.

NUTTALLBURG

Is operated by the Nuttallburg Coal and Coke Company. This mine is worked on the double-entry system and it has two furnaces built of fire brick. Each of these furnaces is used to ventilate a separate part of the workings, and the quantity of air entering each per minute measured 7,600 cubic feet at one, and 8,000 cubic feet at the other. They have considerable water to contend with at times in this mine, and some of the entries were wet, but the miners' working-places were generally drained, and the ventilation was good. The superintendent is an experienced miner, and he has materially improved the system of working and ventilation of late. Wm. H. Holland, superintendent; George Holland, mine-boss.

KEENEY'S CREEK,

Located on the Chesapeake and Ohio Railway one mile east of Nuttallburg, is operated by the same company that operates the Nuttallburg mine. It has a good furnace four and one-half feet wide, four feet high, from bars to arch, and eight and one-half feet long, inner dimensions, with two side passages. On the day that I examined this mine the furnace had not been fired up, but at the last break-throughs on the entries, the average quantity of air passing was 2,200 cubic feet per minute, and the ventilation was in fair condition. W. H. Holland, superintendent; Richard Seymour, mine-boss.

CAPERTON,

On the Chesapeake and Ohio Railway, is operated by William Beury, Cooper & Company. One of the entries in this mine when I examined it had been driven too far in advance of the air-course, and at that point there were several working-places that were not well-ventilated; with this exception the mine was in fair condition. It has four or five outlets, and natural ventilation is used. The coal is drawn out of the dip workings by a wire rope on a drum geared to the friction sheaves that are used for lowering the coal on the inclined plane from the mine to the tipple on the railroad.

J. L. Beury is superintendent, and W. A. Brown is mine-boss.

NEW RIVER

Is operated by the New River Coke Company. It was visited July 29th, and both the ventilation and drainage were found good; in fact, in these respects it would compare favorably with any mine on New river. The air is conducted through the workings in two splits, one of which averaged 2,000 and the other 3,400 cubic feet of air per minute at the heads of the workings, and at the furnace I measured 9,200 cubic feet of air passing per minute. F. Howald, superintendent; R. B. Hanna, mining-boss.

SEWELL, NOS. 1 AND 2,

Are operated by the Longdale Iron Company.

Only a few pillars remain to be taken out of the No. 1, or old mine. After they are removed it will be abandoned and the whole force transferred to the No. 2 mine. The drainage on some of the haulways in the No. 1 mine was not good when last visited, and the mine-boss promised to improve it. No. 2 is a new mine on Mann's creek, eight miles from Sewell. The company has built a three-foot gauge railroad from their coke ovens on the line of the Chesapeak and Ohio Railway at Sewell, to the mine and equipped it with two twenty-ton locomotive engines and a number of cars.

An excellent bin has been built at the mine, and five automatic cradle dumps are used for tipping the coal. The mine is in the Sewell seam. Entries are driven nine feet wide and of good height. Rooms are twenty-eight feet wide, with twenty-four-foot pillars between. The mine has an excellent roof, and with ordinary care in timbering can be made very safe. A small furnace has been built, at which I measured 7,600 cubic feet of air per minute. The ventilation was in fair condition, and the drainage was good; 120 coke ovens are in operation. J. A. McGuffin, superintendent; Thomas G. Burke is mine-boss of the No. 1 mine, and William Turner is the boss of the No. 2 mine.

FIRE CREEK,

On the Chesapeake and Ohio Railway, is operated by the Fire Creek Coal and Coke Company.

It is ventilated partly by a furnace and partly by natural means. The single-entry plan of working is followed here, and in a part of the mine the ventilation was not good; there being working-places too far from the air-current. The quantity of air entering the furnace was 11,760 cubic feet per minute; the velocity being 280 feet per minute at a point where the sectional area of the air-course was forty-two feet. I directed that the ventilation be improved. Ninety-six coke ovens are in operation at this mine. F. Howald, superintendent; James Lang, mine-boss.

ECHO

Was visited March 3d, and found to be insufficiently ventilated. Natural means were relied on to create a current, but the quantity of air thus obtained was not large enough, and besides it was not properly distributed through the workings. I notified the managers of the condition of the mine, and directed that some artificial means of ventilation be provided, and that more attention be given to keeping up the air-courses.

Within a few weeks after this visit, a ventilating fan ten feet in dinmeter was put up, and on a subsequent visit the fan was in operation and circulating 15,000 cubic feet of air per minute; the ventilation was greatly improved, and the drainage was good.

William Beury, Cooper and Company are the operators. J. L. Beury, Superintendent; James Grisinger, mining-boss.

STONE CLIFF, NO. 1,

Is operated by the Beury Coal and Coke Company. When I first visited this mine, April 28th, the quantity of air circulated was not as large as it should have been for the number of persons employed inside, and a stopping was badly needed at a place where there was not any. At the time of my next visit, there was an ample quantity of air at the furnace (7,000 cubic feet per minute), and the ventilation had been improved. The mine-boss, who had lately taken charge, assured me that he would have the mine in good shape shortly. O. C. Kubach, superintendent; John Rusbford, mine-boss.

STONE CLIPE, NO. 2,

Is operated by the same company that operates the No. 1 mine, and is worked in the upper or Sewell seam. I have examined it twice within the year, and either the ventilation or the drainage was found defective at each visit. A large quantity of water issues into the workings, and on account of the soft nature of the floor of the mine, it is difficult to keep it well drained along the haulways where the defective drainage existed. On my last visit, the superintendent promised to give his personal attention to improving the condition of the mine. O. C. Kubach, superintendent; E. J. Toland, mine-boss.

BEECHWOOD

Is a new mine that is being opened by the Beechwood Coal and Coke Company, near Stone Cliff. Only four or five miners are employed at present.

QUINNIMONT

Is operated by the Quinnimont Coal and Iron Company, and is 370 miles by rail west of Newport News, Virginia. The ventilation was tolerably fair, though no artificial power was used to produce it. On some of the haul-ways the drainage was not as good as is desirable. This is the most easterly mine on the Chesapeake & Ohio Railway in this State, and it was the first mine opened on New river. John McIntosh is mine-boss.

MERCER COUNTY.

STIRLING, NO. 1,

Is one mile from Mill Creek junction on the Blue Stone extension of the Norfolk and Western railroad, and 378 miles by rail west from Norfolk, Virginia. Ventilation is maintained by a fan, fourteen feet in diameter, and on March 20th, the quantity of air in circulation measured 38,400 cubic feet per minute. When again visited, the fan was making 44 revolutions per minute, and passing 21,750 cubic feet of air per minute, and about half of this quantity was found near the heads of the workings In one or two places, breakthroughs were needed near the heads of the butt entries, but the ventilation and drainage were generally good. The mine is generally damp enough to keep down the dust, and I found very little dry coal dust in the mine. This I regard as an important matter in the mines worked in this (Pocahontas) seam. In numerous careful examinations, some of them made under very favorable circumstances, I have failed to find any fire-damp in any of the Mercer county mines. John Cooper, superintendent; George Booth, mine-boss.

STIRLING, NO. 2,

Is a new mine, on the opposite side of the ravine from the Sterling, No. 1 mine, and is directly in front of it. It was opened last fall by the Mill Creek Coal and Coke Company. On the 30th of September, the main entry was in about 300 feet, and seven miners were employed in two shifts, driving entries. Twenty-eight coke ovens have lately been completed and fired up at this mine. John Cooper, superintendent; Job Cooper, mine-boss.

BUCKEYE

Is on a branch of Simmons' creek and the Blue stone extension of the Norfolk and Western railroad. It is a new mine opened last summer by Stephenson, Mullin and Company, who now operate it. On September 29th, the main entries were in only about 250 feet from the out-crop. The superintendent informed me that a fan would be provided as soon as the mine could be fully opened. Under date of December 7th, the company wrote me that a fan, twelve feet in diameter, had been purchased and was then on the ground, and that the foundations for it were partly up. Ten coke ovens are in operation and sixteen more are under construction. John D. Hewitt is superintendent.

CASWELL,

Located on a branch of the Blue Stone extension of the Norfolk and Western railroad, is operated by Freeman & Jones. Jenkin Jones, superintendent; Milton Gilmore, mine-boss. When first visited, the volume of air in circulation was 27,000 cubic feet per minute, but the distribution of the air was not so good as was desirable, and I requested the superintendent to have it improved. On my second visit, I found the mine in excellent condition; the fan was making sixty-eight revolutions, and passing 39,840 cubic feet of air per minute, which was conducted through the workings in two splits, each of which was made to ventilate a separate part of the mine. The air-courses were well up, and the volume of air passing at the heads of the workings averaged 14,150 and 16,380 cubic feet per minute, in the different splits.

RELIANCE,

Near the Caswell mine, is operated by William Booth and Company. It is ventilated by two currents which are maintained by a fan twelve feet in diameter.

On March 20th I measured each of these currents where they unite near the fan, and the quantity of air passing per minute in one of them was 20,790, and in the other 21,210 cubic feet, making a total of 42,000 cubic feet per minute which was fairly distributed through the workings. On a later visit the quantity of air in circulation did not differ materially from that found on March 20th, but one of the headings had been driven beyond the proper influence of the ventilating current, and a very inferior quality of oil was used in the mine for lights, which kept a good many of the working-places filled with a smoky and impure atmosphere. I directed the superintendent to see that a good quality of oil was furnished, and to prohibit the use of inferior oils in the mine. James Booth is the superintendent, and W. H. Anderson mine-boss.

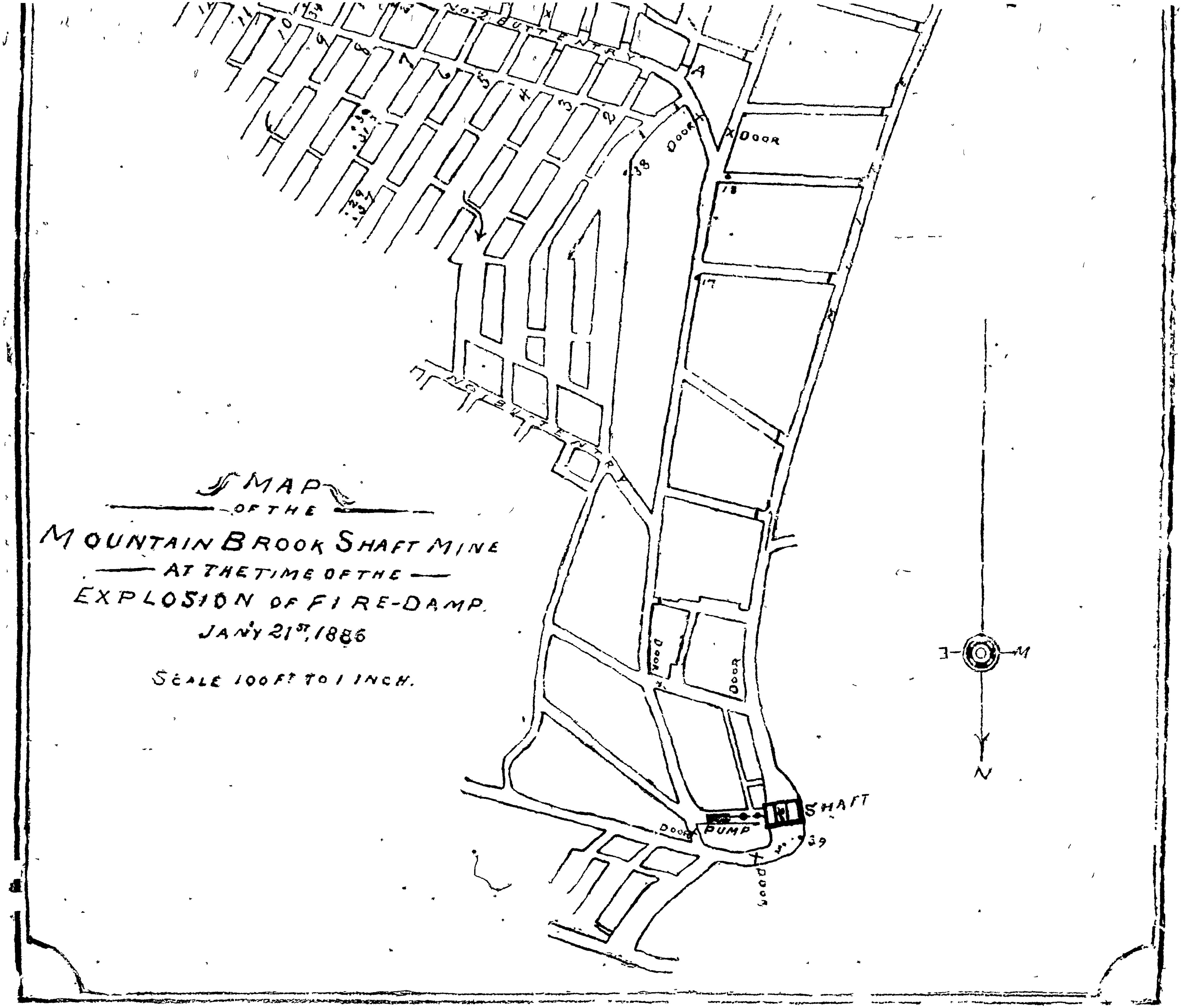
FATAL ACCIDENTS.

January 8th, in Winifrede No. 1 mine, George Calloway was killed at 2 P. M., by a fall of slate in his room. There was a man working with him at the time, who states that he suggested taking down the slate, but Calloway said they would make another cut first. They had been at work only a few minutes afterwards, when the slaft fell, crushing his skull. He was twenty-five years of age and single.

On Thursday, the 21st day of January, at 2:45 o'clock P. M., in the Mountain Brook shaft mine at Newburg, in Preston county, occurred the fatal explosion of fire-damp, by which thirty-nine persons (all that were in the mine) lost their lives, leaving twenty-one widows and thirty-eight orphan children.

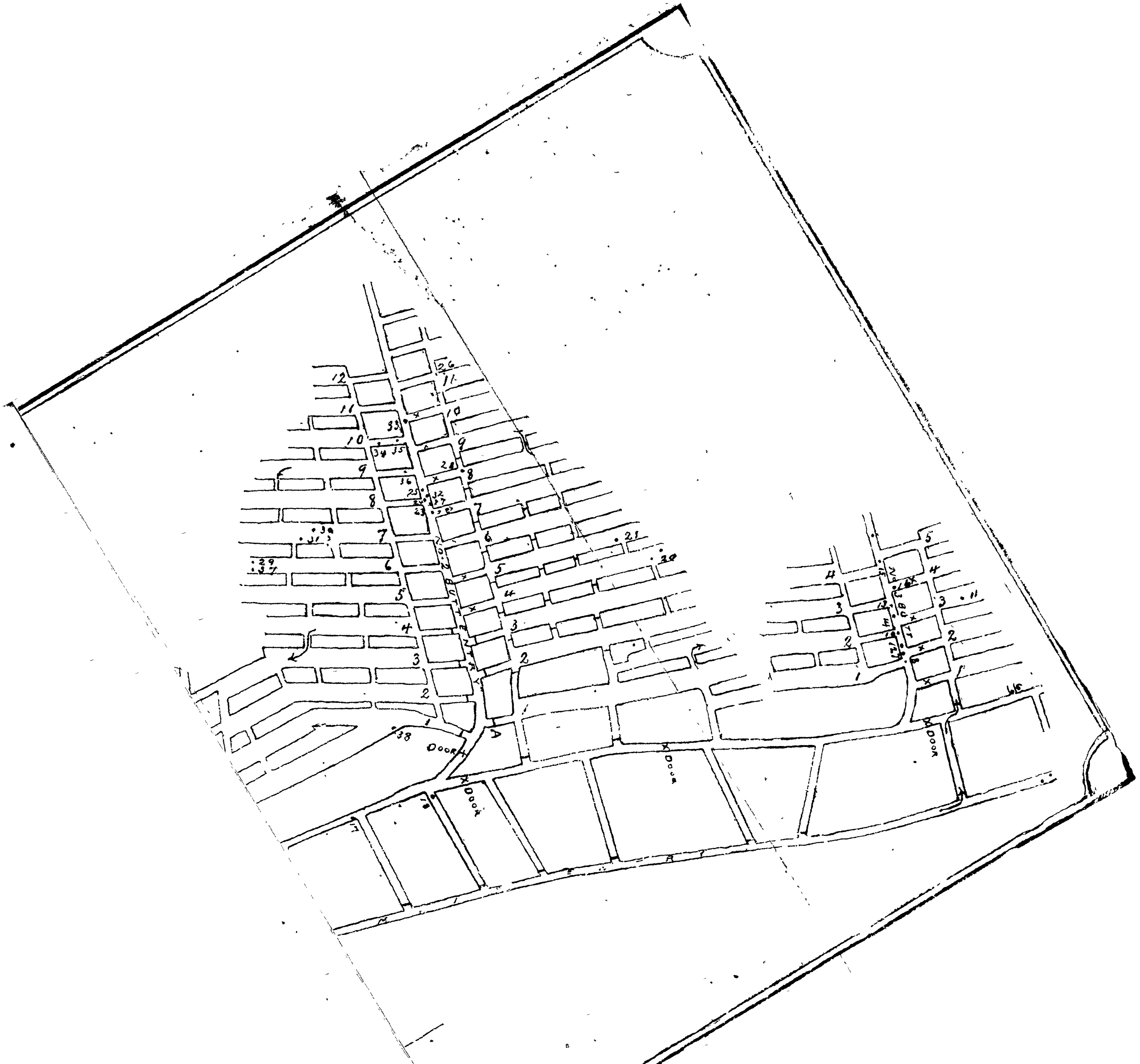
It was comparatively a new mine, having been in operation about two years prior to the accident. The shaft was sunk 10x21 feet, horizontal dimensions, and 360 feet deep from the surface to the bottom of the coal seam, and was divided by a partition from top to bottom into a down-cast and an up-cast for the purpose of ventilation; the down-cast being also used for hoisting. At the bottom of the up-cast a large steam pump was stationed; the exhaust steam from which was used to create the ventilating current.

By reference to the accompanying map, showing the workings of the mine at the time of the explosion, the manner of ventilating the mine may be more readily understood. The air was conducted from the bottom of the down-cast, to near the head of the main entry, thence across to the No. 3 lett butt entry, and after passing through its workings, it was conducted through the workings of the No. 2 left butt entry, thence it passed to the up-cast part of the shaft and up out of the mine. Doors were placed across the mouths of the rooms, and the air was carried up by brattice, close to the faces of such working places as were being driven to the rise of the coal seam, so as to sweep out the fire-damp and prevent its accumulating. The mine was worked with open lights. The accumulation of fire-damp that caused the explosion, from the evidence taken at the



MAP
OF THE
MOUNTAIN BROOK SHAFT MINE
AT THE TIME OF THE
EXPLOSION OF FIRE-DAMP.
JAN'Y 21ST, 1886

SCALE 100 FT TO 1 INCH.


BUTT ENTRY
A
DOOR
DOOR
DOOR
DOOR
BUTT

coroner's inquest, is believed to have resulted from the absence of the stopping marked "A," in the mouth of the first room on the right hand side of the No. 2 left butt entry. The absence of this stopping, as can be readily seen by an inspection of the map, would permit the whole air-current of the mine to pass down this room into the entry, instead of taking the longer route around through the faces of the rooms to the head of the entry. It appeared that water had collected in some of the rooms on the right-hand side of this entry, and for the purpose of draining it off, the superintendent had directed two men, Albert McWilliams and John Hornby, to dig a ditch from the first room on the left, across the entry and some distance into the No. 1 room on the right. This room (the first right-hand) had been abandoned, and the door at its mouth had been closed and nailed fast to the door-frame. When the men digging the ditch reached this point with their work, there is little reason to doubt that the door was forced open, and it is possible that it had remained open or down for two hours or more prior to the explosion. I was away from home among the mines of Kanawha county on the day on which the accident occurred, and was not aware of it until my return home on the morning of Friday, the 22d, when receiving a telegram from the superintendent, I started on the next train for the mine, but owing to poor railroad connections I did not arrive at Newburg until 4 o'clock A. M. Sunday. At that time only three bodies had been recovered; those of Isaiah Timmons, Daniel Miller and Willie Timmons. On reaching the shaft I went down into the mine. Fortunately the main pump at the bottom of the up-cast had not been disabled by the explosion, as the large quantity of water that issues into the mine would in that event have soon flooded the workings and rendered it impossible to explore them until the water could have been removed, but the doors, stoppings and brattices had been torn from their fastenings and wrecked. Many of the props had been knocked out, and large falls of roof had resulted in various places, obstructing the entries and air-ways: Proceeding to the head of the main entry, to which point the ventilation had been partially restored, I saw the body of John Lambert lying about fifteen feet from the head of the entry, and close to the head and just beyond a car that had been partially loaded, was the body of Adolph Wein. Going into the head of the parallel return air-way, after some time spent in searching, I discovered the body of John Edwards. Near the head of this entry the safety lamps showed considerable fire-damp; in fact, a large part of the rise workings was filled with it, and a part of the dip workings was flooded, owing to the disabling of the small pulsometer pump in the dip by the explosion. During the naxt three days the work of putting in stoppings, cleaning up falls, in looking for bodies, and exploring the mine progressed. The workmen were divided into reliefs, which were lead alternately by Messrs. W. B. Brooks, of the Moundsville Shaft mine, James Little, of the Armstrong mine, David Evans and John Laxton, of Newburg, myself and others. Messrs. Little and Brooks, on hearing of this disaster, came long distances to the mine, and rendered valuable assistance in recovering the bodies of the unfortunate miners. Meanwhile, Coroner John P. Jones, of

Terra Alta, was in attendance with a jury. and as each body was hoisted out of the mine it was identified, viewed by the jury and sent to the undertakers. By Wednesday morning all of the bodies had been recovered except those of Albert McWilliams and Bird Miller. These were brought up during the day. On Thursday, the 29th, Coroner Jones, assisted by Neil J. Fortney, Esq., State's attorney for Preston county, began the taking of testimony, which was continued through Friday and Saturday, and a great deal of evidence was brought out; the most important parts of the testimony as recorded by the clerk, are given below:

John Laxton was the first witness sworn. He testified: That he had been employed by the Newburg Orrel Coal Company two years, on the preceding November. That he had had considerable experience in mines. The shaft was not down to the coal when he came; and after finding the coal he had opened the work. He was superintendent of the mine at the time of the explosion; had entire control of the mine, and all the men were subject to his orders. He was present on the day of the explosion; at that time there was one fire-boss, Isaiah Timmons, whose duty it was to go in prior to the men going to work and examine the workings and report to the men at or near the bottom of the shalft, before they went to work. This had to be done every morning.. He had to put up all air-doors and carry the brattice to the faces of the men's work that went beyond the air currents. He (the fire-boss,) had control of the ventilation, and it was his duty to inform him (Laxton,) of any accumulation of gas. Timmons had been employed about six months as fire-boss. He was an old miner, a temperate man, and attentive to his work. They used to meet with little blowers of gas in the headways, but they were only occasional, they came from the roof when faults were struck. The day previous to the explosion, he was in the far butt heading with the men. He did not on that day notice the presence of gas. His opinion was that the explosion took place in the main east heading. He had no other employes except Timmons, on the day of the explosion in the capacity of boss, in the mine. The fire-boss could go around in about an hour and a half, and it was his duty to go around constantly. There was no complaint that he was not doing it. By an occasional inspection, he saw that the fire-boss was doing his duty well. A short time before the explosion, John Bratt was pit-boss to see that the coal was clean, etc. He never put Timmons in authority other than fire-boss, after Bratt left, and he did not consider it necessary just then, to get another man in Bratt's place. He had not discharged Bratt. He had given McWilliams orders to cut the ditch, and McWilliams and Hornby were working at the ditch on the day of the explosion. He had told McWilliams to dig the ditch through without taking the door down. The ditch was two feet six inches deep and eighteen inches wide. McWilliams was working in the shaft when he (Laxton,) took charge, and knew the theory of brattice, for he, (Laxton,) had told him of it. They had a fan but if it had been used ice would have formed in the shaft. If the doors were thrown wide open the air would not close them, and the neglect to close a door would have the same effect as taking down a stopping. The inspector had spoken to him about self-closing doors. It was the driver's place to see that the doors were shut, but he had expected to put springs on them when he got more mules in. The fire-boss had told him on the night before the explosion that all was right. McWilliams was subject to the orders of the fire-boss.

John Miller, a miner, was the next witness. He testified: That he began work in the mine in May before the explosion, was employed as a digger, and worked in the fifth room. He came out of the mine about two hours and a half before the explosion. He knew McWilliams and Hornby. They were working in the first room on the right hand side of the butt heading, where the door that was supposed to have been knocked down, was located. As he had passed the mouth of this room, on his way out of the mine, he had heard them knocking on the door. He asked McWilliams what they were doing it for, and he said he was going to knock that bratticing out, to dig the ditch through, the ditch was then to the door. The door did not open; it was fastened up. He heard the pounding on the door until he had passed through a door on his way to the shaft. McWilliams came out soon after and went up with him to his dinner. McWilliams did not say that he had taken the door down. When he came out Timmons was at the bottom of the shaft. It was just about 12 o'clock when he passed McWilliams and Hornby, and the pounding on the door seemed to be as though they wanted to tear it down.

John T. Bratt was sworn and testified: That he was employed by the company from the 10th day of August, up to the Monday before the explosion, as mining-boss. He knew something of ventilation, and the ventilation of the mine was good. He thought Timmons was a competent man. He said that a door had been torn off by a loaded car sometime before he quit, and after the door had been down a half or three quarters of an hour, he went in and found three or four feet of gas. He thought that McWilliams ought to have known better than to knock out the door. He thought that he had seen the superintendent under the influence of drink while in the discharge of his duty. He did not think it would require more than two hours for the gas to accumulate sufficiently to do just what it did do.

David Evans testified: That he was employed in the shaft from its beginning up to two months prior to the explosion. Had had years of experience as a miner, both in the old country and in this country; was with one company five years in the old country, and came to America with recommendations.

He was fire-boss in the mine until Timmons came in. His duty was to go down in the morning and see about gas, and come back and meet the men and tell them of any danger; he would come back to the shaft about 7 o'clock and stay until 8, to see that the men were all in It was his duty to see about doors; he would go around once, twice or oftener—no particular times—and was not required to do anything else, but he would work at doors and brattices.

Door No. 1, on the right-hand, was first a canvass door, then a board door, and then it was nailed to the posts.

He quit as fire-boss in August; had never found occasion to differ from Laxton's instructions, and he had no particular cause for quitting.

When he was fire-boss there was not much gas except pockets here and there; there was but one trapper, and he was at the only place necessary for one; at the other doors it was the duty of persons passing through them to keep them closed.

Once when the ventilation had been cut off from the mine for four hours, he went in to see what the effects were. and found about three feet of gas about 200 feet back from the end of the work.

W. M. Paul testified that he had had a conversation with McWilliams a few days before the explosion. McWilliams was then digging the ditch, and said that he was going to tap a dead room to carry water to the sump.

A large quantity of other testimony was taken, but the above were the principal points that threw any light on the immediate cause of the explosion. The jury rendered the following verdict:

[COPY.]

STATE OF WEST VIRGINIA, }
COUNTY OF PRESTON, } SS:

An inquisition taken at Newburg, in the county of Preston, the 22d day of January, 1886, before John P. Jones, Coroner of the said county of Preston, upon the view of the bodies of Isaiah Timmons, Daniel Miller, William Timmons, Adolph Wein, John Lambert, John Edwards, George Riggins, Jos. Guy, John Conoway, Charles Turnley, Clinton Albright, Henry Guy, Richard Birtley, Nicodemus Birtley, Thomas Guy, John Byers, Joseph Johnson, John Hornby, Wm. Lamire, Frank Lamire, J. Rosskelly, E. Fortney, Arthur Ogden, Mike Kenny, John Carroll, Jacob Weaver, Michael Clark, Andrew Scott, Newton Moore, Alvey Weaver, Wm. Sandsberry, Peter Handley, Henry Lambert, Morgan Freeman, C. W. Spencer, James McGowan, Frank Moore, Albert McWilliams and Bird Miller, there lying dead.

The jurors sworn to inquire when, how and by what means the said Isaiah Timmons, Daniel Miller, William Timmons, Adolph Wein, John Lambert, John Edwards, George Riggins, Jas. Guy, John Conoway, Chas. Turnley, Clinton Albright, Henry Guy, Richard Birtley, Nicodemus Birtley, Thos. Guy, John Byers, Joseph Johnson, John Hornby, William Lamire, Frank Lamire, J. Rosskelly, E. Fortney, Arthur Ogden, Mike Kenny, John Carroll, Jacob Weaver, Michael Clark, Andrew Scott, Newton Moore, Alvey Weaver, Wm. Sandsberry, Peter Handley, Henry Lambert, Morgan Freeman, C. W. Spencer, James McGowan, Frank Moore, Albert McWilliams and Bird Miller came to their deaths, upon their oaths do say: That they find their deaths were caused by the explosion of fire-damp in the Mountain Brook Shaft Mine, of the Newburg Orrel Coal Company at Newburg, Preston county, West Virginia, on the 21st day of January, 1886, which accumulated by reason of a door or stop being open and changing the air-current from its proper course; thereby depriving a large portion of the mine of sufficient ventilation.

We also find, that on the said 21st day of January, 1886, there was a violation of the first paragraph, of section 6, of chapter 70, of the Acts of the

Legislature of West Virginia, 1883, which reads as follows: "6. In order for the better carrying out of the provisions of this act, the owner, lessee or operator of every such coal mine shall employ a competent and practical overseer, or mining-boss, whose duty it shall be to keep careful watch over all the ventilating apparatus placed in such mine, as well as the air ways, traveling ways and supports of every kind placed therein, and to see that all loose coal and rocks in the entry overhead be removed or carefully secured, so as to prevent injury to persons working therein, unless such owner, lessee or operator being competent as aforesaid, performs such duty himself.

We also find that the instructions of the inspector of mines of this State were being disregarded at the time of the accident.

In testimony whereof, the said coroner and jurors hereto set their hands this 30th day of January, 1886:

Gus J. Shaffer,
James McGee,
Thomas D. Howard,
John C. Mayer,
James F. Stuck,
John C. Howell,
William Shaw,
C. A. Holmes,
James Harrington,
William Lawrence,
John Menefee,
F. Richter.

John P. Jones, Coroner. *Jurors.*

In addition to the foregoing verdict we would say that we regret to find that the statute of our State contains no edequate law for the protection of that portion of our population engaged in mining. The rapidity with which our vast mineral resources are being developed, the large and constantly increasing number of persons engaged in mining, and the dangers to which they are subjected in the pursuit of their perilous calling, would appear to be ample argument for the enactment of laws that would insure as far possible, their health and safety. On the contrary we find upon our statute books a law professing to regulate the working of mines, but containing only nominal penalties for its violation. It provides for the appointment of a State inspector of mines, while under its provisions he can do but little more than advise and entreat those who disregard the Act. We mean no reflection upon those gentlemen through whose efforts the law was enacted, for they encountered difficulties which prevented them making it what it should be, and we congratulate them that they were at least partially successful.

It is however to be hoped that our next legislature will give us a law governing the working and management of mines, which will in its provisions be commensurate with its importance, and that other horrors such as we have just witnessed, will not be required to awaken them to a sense of their duties; and while we feel that the duties of the State inspector of mines are well defined, and in this case have been faithfully discharged, yet unless additional power or authority be given him by law, (to be enforced by injunction or otherwise,) to promplly restrain the owner or operator of a mine from further prosecution of the work, on a failure to obey his orders, or when his suggestions are disregarded, when in his judgment there is danger of an accident, the law creating his office can be of little benefit to those engaged in the dangerous calling, and feel it to be our duty to thus publicly urge upon our law-makers the necessity of a radical change in our mining laws.

GUS. J. SHAFFER,
JAMES MCGEE,
T. D. HOWARD,
JOHN C. MAYER,
JAMES F. STUCK,
JNO. C. HOWARD,
WILLIAM SHAW,
C. A. HOLMES,
JAMES HARRINGTON,
WILLIAM LAWRENCE,
JOHN MENEFEE,
F. RICHTER,
Jurors.

JOHN P. JONES, Coroner.

The following is a list of the persons killed, showing their approximate ages, whether married or single, the number of children left, and their places of working in the mine, according to the best information that I could gather. The number preceding each name, corresponds with the number on the map, marking the point where the body was found after the explosion:

	NAME.	Age	Married or Single.	No. of Children left.	Place of Working in the Mine.
1	Isaiah Timmons	47	Married	4	He was the fire-boss.
2	Daniel Miller	35	Married	4	Was cager at the bottom of the shaft.
3	William Timmons	14	Single	.	Trapper at the double-doors near the shaft.
4	Adolph Wein	24	Married	0	Head of the main entry.
5	John Lambert	30	Married	1	Head of the main entry with Adolph Wein.
6	John Edwards	24	Single	....	Head of the parallel return air-way.
7	George Riggins	24	Married	2	Track layer in the mine
8	Joseph Guy	26	Married	....	2d room on the right of the 3d butt entry.
9	John Conoway	21	Single	....	Head of the 3d butt entry.
10	Charles Turnley	20	Married	1	Driver in the mine.
11	Clinton Albright	23	Married	..	3d room on the right of the 3d butt entry.
12	Harry Guy	29	Married	1	3d room on the left of the 3d butt entry.
13	Richard Birtley	52	Married	3	4th room on the right of the 3d butt entry.
14	Nicodemus Birtley	15	Single	....	3d room on the left of the 3d butt entry.
15	Thomas Guy	19	Single	....	5th room on the right of the 3d butt entry.
16	John Byers	24	Married	....	4th room on the right of the 3d butt entry.
17	Joseph Johnson	25	Married	3	1st room on the right of the 3d butt entry.
18	John Hornby	18	Single	....	Mouth 1st room right of 2d butt entry dig. ditch.
19	William Lamire	18	Single	....	4th room on the right of the 2d butt entry
20	Frank Lamire	18	Single	....	4th room on the right with William Lamire.
21	Joseph Rosskelly	40	Married	3	5th room on the right of the 2d butt entry.
22	E. Fortney	18	Single	....	7th room on the right of the 2d butt entry.
23	Arthur Ogden	24	Married	2	7th room with E. Fortney.
24	Mike Kenny	24	Single	....	8th room on the left of the 2d butt entry.
25	John Carroll	50	Married	....	9th room on the left of the 2d butt entry.
26	Jacob Weaver	36	Married	5	11th room on the right of the 2d butt entry.
27	Michæl Clark	23	Single	....	9th room on the right of the 2d butt entry.
28	Andrew Scott	22	Single	....	8th room on the right of the No 2 butt entry.
29	Newton Moore	35	Married	....	6th room on the left of the 2d butt entry.
30	Alvey Weaver	30	Single	....	7th room on the left of the 2d butt entry.
31	Wm Sandsberry	30	Married	3	7th room on the right with Alvey Weaver.
32	Peter Handly	23	Single	....	9th room on the right with Mike Clark.
33	Henry Lambert	24	Married	1	11th room on the left of the 2d butt entry.
34	Morgan Freeman	22	Married	1	10th room on the left of the 2d butt entry.
35	C. W. Spencer	21	Single	....	10th room on the left with Morgan Freeman.
36	James McGowan	50	Single	....	9th room on the left with John Carroll.
37	Frank Moore	16	Single	....	6th room on the left with Newton Moore.
38	Albert McWilliams	30	Married	4	Mouth of the first right room digging ditch.
39	Bird Miller	15	Single	. .	A driver in the the mine.

I examined the place where the door stood that is supposed to have been taken down. A large fall of roof had occurred just beyond, and the edge of the fall covered the floor of the mine between the door-posts, which were still standing. Water had been backed from the dip workings to a depth of about two feet at the place, but by closing up the fall between the posts, laying a straight-edge across where the door stood. and feeling down in the water with my hand, I discovered that the ditch was not up to where the door appeared to have stood, by about six inches. In the facing to which the door was nailed, three nails were sticking nearly straight as though their heads had been drawn through the boards of the door or the boards split off, without drawing the points of the nails out of the facing. Every indication showed that the force of the explosion at that point, was down the room towards the No. 2 butt entry, and if the door had been standing at the moment of the explosion, it is likely that the nails that held it would have been broken off, as the door would have been forced through between the posts, or the posts swept away with it. I looked carefully for the door but failed to find it or anything that could be recognized as a part of it.

I first examined this mine October 27, 1885, about three and a half months after I had assumed the duties of inspector of mines, and found its condition unsatisfactory. There was but one outlet to the mine, and the cage (they were using but one cage at that time,) was without cover or safety-catcher. On entering the mine, I discovered that a good deal of fire-damp was given off in the workings, some of the doors were imperfectly fitted, and that the system of working (single butt entries,) was not the best for the safe handling of large quantities of fire-damp. The second butt entry at that time had only about 150 feet further to go, before it would have been to the company's property line which ran nearly north and south and nearly at right angles to the direction of the left butt entries. I measured the ventilation and found 10,140 cubic feet of air entering the up-cast per minute and about half of this quantity at the head of the workings. The ventilation was maintained by exhaust steam from the pump, discharged into the bottom of the up-cast. I discussed these matters with the superintendent, directed his attention to the doors and to the importance of their being well made and self-closing so as to avoid as far as possible, the danger of their being left open. I suggested a fan for ventilation, and he promised to get one and to fix the doors and to put cover and safety catches on the cage. When I spoke of another outlet to the mine, he intimated that the company would have to be consulted. I again visited the mine November 3rd, seven days later, for the purpose of further conversing with the superintendent in regard to the needed improvements. When I again mentioned the fan he replied: "I have ordered a fan since you were here;" and generally, he seemed disposed to comply with the instructions that I had given. On November 9th, six days later, I wrote him from Wheeling in reference to improving the mine so as to secure greater safety and ended the letter by urging him to use every reasonable precaution against the dangers of fire-damp. After my arrival at home, the following correspondence occurred, the first letter being a reply to my letter from Wheeling:

[COPY.]

NEWBURGH, PRESTON CO., W. VA., Nov. 11, 1885.

DEAR SIR: Replying to your letter of the 9th inst., beg to say that I have noted the contents. Will have the safety catches applied, and the cover I am now fixing for the top of the cage; will also get springs to the air doors where required. We have ordered from Crawford & McCrimmon one 10 foot fan, which I intend getting fixed immediately upon its arrival. Respecting a second outlet, I quite agree with yourself upon this point, and will advise our company upon this important matter, which I know will be agreed upon, if they can see that the shaft coal will be a success. I think you, perhaps, may also give them your views and opinion upon this.

I remain,
Yours Truly,
H. J. TUCKER, Esq. JOHN LAXTON.

[COPY.]

SEWELL DEPOT, FAYETTE CO., W. VA., Nov. 17, 1885.

Newburg Orrel Coal Company, 25 South Gay St., Baltimore, Md.:

DEAR SIRS:—As State Inspector of Mines for West Virginia, I examined your Mountain Brook shaft mine, at Newburgh, Preston county, W. Va., on the 27th of October This mine gives off fire-damp freely, and it has but one outlet. I write this to urge that a second outlet be made. Generally speaking, all shaft mines should have two outlets, separated by natural strata of ample thickness, but this becomes specially important for the safety of the miners, when fire-damp is generated, as in your shaft mine.

I have spoken to Mr. Laxton, the superintendent, about this matter; and have, in addition, requested him to adopt the usual safety appliances at the shaft, and to increase the ventilation. Please let me hear from you at your earliest convenience.

Yours Truly.
H. J. TUCKER,
State Inspector of Mines.

[COPY.]

H. J. Tucker, Inspector of Mines, Sewell Depot, Fayette Co., W. Va.:

DEAR SIR: Absence from town has prevented me from replying to yours of the 17th sooner. When Mr. Vesey examined our Mountain mine, some few months ago, he was highly pleased with the ventilation, and remarked that the air current was sufficient for 500 miners. I constantly go down and through these mines, and can not observe any change for the *worst* since Mr. Vesey's visit. Nevertheless, to meet your suggestions as far as possible, I have bot a 10 foot fan, which will be put on at once, and will order the safety catches for the cage. Regarding another outlet, the shaft is not yet developed, and it would be impossible to make an open *now*, which would or could prove an advantage to the men. Some 4 or 5 years hence this could be done, when we are opened up sufficiently. For the safety of the men we have a separate engine and a separate hoist, and the greatest safety of them all, one which the Mine Inspector does not seem to understand and appreciate—the interest of our men and our property are at heart.

Yours truly,
CHARLES MACKALL.

Here the correspondence ended. I fully expected that the fan would be put up the doors fixed, etc., without unnecessary delay. I intended to insist on the sinking of another outlet to the mine, but under the mining law, I could not do anything towards compelling the company to sink it until the next term of the Circuit Court of that county, which would sit April 10th. From the 3d of November (the time of my second visit), to the time of the explosion, I was busily engaged in completing the inspection of the mines and making my report for the year, and therefore I did not have an opportunity of again visiting the mine prior to the explosion. A short time before the explosion occurred I wrote the superintendent asking whether the fan was working, etc., but I received no reply. Believing that the law had been violated, I appeared before the grand jury of Preston county, at the April term, 1886, with a copy of the testimony taken at the inquest, and the verdict of the coroner's jury and gave my own testimony, but no indictment was found.

April 10th, in Cannel mine, Wilson Wright, a colored miner, was killed by the fall of top coal. He was drawing a pillar at the time, and cut into a "slip," when the top coal being insufficiently propped fell on him and he died in about twenty minutes. He was fifty-five years of age and married, with several children.

April 12th, at the Coalburg mines, John Trail, while under the coal tipple, was injured by a lump of coal falling and striking him on the stomach. Peritonitis set in and caused death. He was forty-two years of age, and left a widow and seven children.

May 31st, in Elk Garden mine, No. 4, John H. Pase, a driver, twenty-four years of age, was caught between a car and a rib of coal and his head crushed. He left a widow.

June 25th, in Eagle mine, Thomas Gully, about thirteen years of age, was instantly killed by a fall of slate at the face of a room in which he was helping his father.

July 19th, on the tramway at Elk Garden No. 1 mine, James Rice, the locomative engineer, was killed by falling in front of his engine, which passed over him, cutting his head off. He was seen to fall, and it is supposed that he had a stroke of appoplexy. He was fifty-six years of age. and left a widow and five children.

August 21st, at Stone Cliff mines, Richard Sullivan fell off the tipple at the foot of the inclined plane and was instantly killed. He was not at work at the time, but had started to go up to the mines. He was forty-five years of age and left a widow.

November 1st, at Fire Creek mine, Noah Perkins, colored, while shifting cars with a pinch-bar on the coke-yard, was injured by being caught between two cars. While he was working at one car, another car behind him, which had not been secured by tightening the brake, ran down unobserved and caught him between the cars when they came together. He died November 2d, aged forty years, and left a widow.

November 16th, in Excelsior mine, Willie Caldon, a driver, was killed by a fall of slate. He was about twenty years of age and single.

NON-FATAL ACCIDENTS.

February 9th, in Sewell, No 2 mine, William Turner, the mining-boss, had his leg broken below the knee by a fall of slate. He was examining the roof in a working place when the accident occurred.

February 16th, in Elk Garden No. 1 mine, George Bowler was injured by a mine-prop falling on him. Lost two weeks work.

February 16th, in Carver's mine, John H. Tasker injured himself by lifting at a mine car.

February 17th, in Nuttallburg mine, William Holland was injured by a mine car.

February 22d, in Boggs' Run mine, Peter Maurer was injured and his leg broken by a fall of slate.

February 24th, in Carvers' mine, John H. Cobb was riding on a car loaded with rails in the mine. The ends of the rails caught and crushed him against the roof. He lost three months from work.

March 1st, in Fire Creek mine, Sonny Sellers, colored, a driver, had his leg broken by a car.

March 10, in Elk Garden mine, Anthony Maloy was injured by running a coal pick into his ankle.

March 15th, in Stevens Coal Company's mine, Sim. Abshire had his collar bone broken by a fall of coal in his room.

March 17, in Eagle mine, Stephen Turner, colored, was injured by a blast. He had returned to put in a new fuse thinking that the first one had failed.

April 15th, in Stone Cliff No. 2 mine, George H. Verigan had his leg crushed by a fall of roof in drawing a pillar. He had it amputated May 6th.

April 20th, in Cannel mine, Daniel Madison lost the sight of one of his eyes by a small piece of cannel coal flying into it.

May 8th, in Wilsonburg mine, Nathan Fowler was injured by a fall of coal while making an under-cut; lost 5 days.

May 14th, in Winifrede No. 1 mine, Archie Carr, colored, had his leg broken by a fall of slate.

May —, in Southside mine, (Wheeling,) Amos Fritz had his hand crushed by a fall of coal; lost 20 days.

June 1st, in Faulkner's No. 2 mine, William Sims had his foot crushed by a fall of coal.

June 5th, in Reliance mine, Green Scott was hurt by a fall of coal.

June 24th, in Elk Garden No. 2 mine, Patrick Calry, knee mashed by a fall of coal.

June —, in Straughan's mine, J. T. Blackburn, a driver, fell in front of a car which passed over his leg and broke it below the knee.

July 7th, in Sewell No. 1 mine, Robert Watson was severely crushed by a fall of slate. He knew that the slate was loose and had set a prop to hold it but the slate broke and fell on him. His recovery is yet doubtful.

July 13th, in Star mine, G. Drilech was injured by a fall of coal and slate, and James Hudspatch was injured by a fall of slate in his room and lost 4 weeks from work.

July 19th, in Coalburg No. 1 mine, John Johnson, a driver, was run over by a car and his leg was broken; lost 6 weeks from work.

July 21st, in Elk Garden No. 1 mine, Henry Paugh was injured by a horse falling on him; he lost 4 week's work.

July 23rd, in Pinnickinnick mine, John Convy, a driver, was caught between the car and the roof and his collar bone broken.

July 26th, in Caswell mine, Clarence Banks had his arm broken.

July 27th, in Caswell mine, John Campbell had his foot crushed by a car and it had to be amputated.

July 29th, in New Haven mine, Ellison Ord had his leg cut off by a fall of slate.

August 3rd, in Moundsville shaft mine, Nicholas Walters was injured by a fall of coal crushing his knee.

August 4th, in Aurora mine, D. M. Harr was injured by flying coal from a shot. He was driving a break-through when a shot was put off in the adjoining room without notifying him and it broke through.

August 4th, in Elk Garden No. 1 mine, David Kerr was injured by a fall of coal.

August 10th in Reliance mine, Thomas A. Coleman, back injured by a fall of coal.

August 14th, in Armstrong mine, Edward Kegan was injured by a fall of coal. He lost two months work.

August 19th, in Star mine, James Lawrence was injured by a fall of coal.

August 20th, in the new shaft at the Moundsville shaft mine, C. D. Guthrie lost the sight of one of his eyes by a piece of steel flying from a drill.

September 1st, in New River mine George Williams, back injured by a fall of slate. He lost two months work.

September 6th, in Stone Cliff No. 1 mine, Ed. Freeman was injured by a fall of slate.

September 8th, in Dana Brother's mine, Johnson Young was injured by a fall of slate.

September 11th, in Elk Garden mine, John Keegan was injured by running a coal pick into his foot; lost two week's time.

September 16th, in Crown Hill mine, B. B. Perry, leg broken by a car that got loose and ran out of a room striking him as he was going to work.

September 20th, in Caswell mine, C. C. Hopkins, jaw bone broken by a fall of coal.

September 22d, in Crescent mine, (Fayette county,) Edward McAlister was injured by falling in front of a car.

September 23d, in New River mine, Bennet Scott had his leg broken by a fall of slate.

September 28th, at Caperton mine Frank Richards, leg broken by a runaway on the incline plane.

October 12th, in the new shaft at Moundsville shaft mine, Julius Adams, leg broken by a bucket falling in the shaft.

October 14th, in Crescent mine, (Fayette county,) William E. Pritt was bruised about the head and shoulders by falling coal.

October 15th in Coalburg No. 1 mine, Iohn Dorsey was crippled by a fall of coal, and lost two month's work.

October 18th, in Moundsville shaft mine, George Strother and Harris Ross were burned by firing gas and smoke directly after a blast.

October 19th, in Moundsville shaft mine, Elmer Riggs, a boy 15 years old, had his leg crushed by a car passing over it. The leg was amputated.

October 21, in Austen mine, Andrew Clark lost a finger by a fall of slate.

October 30th in Nuttallburg mine, Alec. Thompson was injured by a fall of slate in his room.

November 15th, in Sterling mine, (Mercer county,) J. G. Lambert was injured by a fall of slate.

November 18th, in Mountain Brook shaft mine, Daniel McKay had his collar bone broken by a fall of coal.

November 23d, in Powellton mine, William England, hand injured by a coal pick.

November ——, in Powellton mine, Charles Lindsey, a driver, was bruised by being caught between two cars.

December 4th, in Nuttalburg mine, David Pegram was injured by a fall of slate in his room.

December 18th, in Star mine, J. H Kersey was injured by a fall of coal.

Summary:

Number of deaths from accidents inside the mines	44
Number of deaths from accidents outside the mines	5
Total number of deaths from accidents in and about the mines	49

Causes of Fatal Accidents.

By falls of roof	3
By falls of coal	1
By mine cars	1
By explosion of fire-damp	39
Miscellaneous	5
Total number of deaths from accidents.	49

Causes of Non-Fatal Injuries.

By fall of roof	16
By fall of coal	16
By mine cars	12
By coal picks	3
By blasts	2
Miscellaneous	9
Total number of non-fatal injuries	58

TABLE I.—LOCATION OF COLLIERIES IN THE NORTHERN PART OF THE STATE.

Name of Colliery.	Name of Operator.	Name of Superintendent.	Location—County.	Post Office Address
Wellsburg Shaft	C. M. Crawford	J. C. Cram	Brooke	Wellsburg
Wellsburg	Forbes, Carmichael & Company	William Forbes	do	do
Coopers'.	Cooper Brothers	Joseph Cooper	do	Short Creek
Top Mill	Wheeling Iron & Nail Company	H. H. Hornbrook	Ohio	Wheeling
Fulton	Marshall & Van Fossen	I. B, Van Fossen	do	do
Manchester	Manchester Coal Company.	R. J. Smyth	do	do
Whitaker	Whitaker Iron Company	N. E. Whitaker.	do	do
Crescent	Kaseley & Brooks	T. E. Kaseley.	do	do
Belmont	Belmont Nail Company	L. Barum	do	do
Riverside	Riverside Iron & Steel Company	F. J. Hearn	do	do
La Belle	La Belle Iron Works	C. Robinson	do	do
South Side	Kaseley & Brooks	J. W. Brooks	do	do
Elm Grove Shaft	W. T. Chambers & Company	W. T. Chambers	do	Elm Grove
Boggs' Run	Boggs' Run Mining & Manufacturing Company	Phillip Kunz	Marshall	Wheeling, Ohio County
Benwood Iron Works	Benwood Iron Works		do	Benwood
Moundsville Shaft	Moundsville Coal Company	J. O. Brooks	do	Moundsville
West Fairmont Shaft		F. T. Martin	Marion	Fairmont
Central	Oliver Jackson	Oliver Jackson	do	do
Aurora	Newburg Orrel Coal Company	Morgan D. Orr	do	Palatine
Montana	Montana Coal & Coke Company	J. E. Watson	do	Fairmont
Palatine	Newburg Orrel Coal Company	Morgan D. Orr	do	Palatine
Gaston	Gaston Gas Coal Company	Jas. E. Watson	do	Fairmont
New England	New England, Fairmont & Western Gas Coal Co.	R. D. Wilson.	do	do
Irondale	F. Nemegyei		Preston	Independence
Mountain Brook Shaft	Newburg Orrel Coal Company	John Hogg	do	Newburg
Austen	Colgate & Company	C. Jessop	do	Austen
Armstrong	Big Vein Coal Company	James Little	Mineral	Piedmont
Atlantic	Atlantic & George's C'k Con. C. Co	L. T Dewitt	do	do
Elk Garden No. 1	W. Va C. & Pittsburg R. R. Company	A. C. Rawlins	do	Elk Garden
Elk Garden No. 2	do do	do	do	do
Elk Garden No. 4		Owen Riordan	Tucker	Thomas
Davis	H. G. Davis & Brother	James Brown.	do	Davis
Tyrconnel, Nos. 1 and 2	Newburg Orrel Coal Company	J. H. Henry	Taylor	Tyrconnel
Ocean	Consolidated Coal Mining Company	R. D. Wilson	Harrison	Bridgeport.
Despard	Despard Coal Company	Mord Lewis	do	Clarksburg
Harrison County	Harrison County Coal Company	John Corpening	do	do
Pinnickinnick	T. P. Brannon & Company	T. P. Brannon	do	do
Farland's	J. T. Farland	J. T. Farland	do	do
Wilsonburg	Howard Coal & Coke Company	John Temple	do	Wilsonburg
New Haven	Hugo Juhling	Hugo Juhling	Mason	New Haven
Hartford City	Hartford City Salt Company	Thos. E. Jones	do	Hartford City
California	William Juhling	William Juhling	do	do
Sehon	C. A. Bettinger & Company	C. A. Bettinger	do	do
Mosquito	Liverpool Salt Company	Charles Clifton	do	do

TABLE I.—Continued—*LOCATION OF COLLIERIES IN THE NORTHERN PART OF THE STATE.*

Name of Colliery.	Name of Operator.	Name of Superintendent.	Location—County.	Post Office Address.
German Furnace	German Salt & Coal Company	John Mees	do	Mason City
Hope	Hope Coal & Salt Company	Edward Edwards	do	do
Sterling	W. E. Edwards	W E Edwards	do	Clifton
Clifton	Maxwell Manufacturing Company	A. Robson.	do	do
New Castle	W. E, Edwards	W. E. Edwards	do	do
Camden	Consolidated Coal & Mining Company	Georgo Brushears	do	West Columbia.

TABLE II.—LOCATION OF COLLIERIES IN THE SOUTHERN PART OF THE STATE.

Name of Colliery.	Name of Company.	Name of Superintendent.	Location—County.	Post Office Address.
Energetic	Energetic Coal Company.	D. L. Anderson	Putnam	Energetic.
Star	Marmet Mining Company	Geo. W. Cawley	do	Raymond City
Black Band	Black Band Iron and Coal Company	A. M. Woolridge	Kanawha	Spring Hill
Beane's	Welton Coal and Salt Company.	M. Beane	do	Malden
Boyce	Campbell's Creek Coal Company	J. E. Dana	do	do
Calderwood	do	do	do	do
Dana Brothers'	Dana Brothers	George Dana	do	do
Pioneer No. 4	Pioneer Coal Company.	J. J. Lovell	do	do
Dickinson's	John Q. Dickinson and Company	John Q. Dickinson	do	do
Bennington	W. S Carkin	F. F. Holt	do	Carkin
Winifrede Nos. 1, 2 and 3	Winifrede Coal Company	R. B. Cassady	do	Winifrede
Black Diamond	Black Diamond Coal Company	William Sharpe	do	Peerless
Peerless	Peerless Coal Company.	H. S. Hallwood	do	do
Stevens Coal Co	Steven's Coal Company	L. F. Garrison	do	Coalburg
Coalburg Nos. 1 and 2	Robinson Coal Company	Neil Robinson	do	do
North Coalburg	Lovell Coal Company.	R. C. Lovell	do	Shrewsbury
Peabody	Peabody Coal Company	G. W. Connell	do	Peabody
Cedar Grove	Cedar Grove Mining Company	J. G. W Tompkins	do	Cedar Grove
East Bank	Stuart M. Buck	Stuart M. Buck	do	Coalburg
Blacksburg	George B. Reynolds	G. B. Reynolds	do	Hampton
Kelly's Creek	Cedar Grove Pure Coal Company	J. G. Durbin	do	Cedar Grove.
Crown Hill	Crown Hill Splint Coal Company	Brewer Smith	do	Paint Creek
Wacomah	Kanawha Cannel Coal Company	H. W. Reynolds	do	Wacomah
Kanawha	Kanawha Mining Company	G. L. Drouillard	do	Coal Valley, Fayette Co
Union	Union Coal Company	Edward Pinkney	do	do do
Cannel	Cannelton Coal Company	Henry Davis	do	Cannelton
Mount Morris	Mount Morris Coal Company	Wm. Trudgen	do	Coal Valley, Fayette Co
Excelsior	M. T. Davis and Company	M. T. Davis	do	do do
Eureka	do	do	Fayette	do do
Carvers'	Carver Brothers	John Carver	do	do do
Straughans	Straughan Coal Company	Ceo. Straughan	do	do do
Coal Valley	Coal Valley Coal Company	Thos. P. Davis	do	do do
Crescent	William R. Johnson	T. A. Bartlam	do	do do
Faulkner's, No. 1 and 2	Frederick Faulkner	F. Faulkner	do	Frederick
Eagle	William Wyant	William Wyant	do	Eagle
St Clair	St. Clair Company	do	do	do
Powellton	The Mount Carbon Company	W. N. Page	do	Powellton
Great Kanawha	Great Kanawha Colliery Company	S. Macdonald	do	Mount Carbon
Hawk's Nest	Hawk's Nest Coal Company	S. M. Taylor	do	Hawk's Nest
Gaymont	Joseph Pirrung	Joseph Pirrung	do	do
Sunnyside	Thomas and Lomax	Edward Thomas	do	do
Elmo	W. A. Burke and Company	G. W. Hamilton	do	Elmo
Fayette	Joseph Lawton and Company	George Lawton	do	Fayette Station
Nuttallburg	Nuttallburg Coal and Coke Company	W. H. Holland	do	Nuttallburg
Keeny's Creek	do do	do	do	do

TABLE II.—Continued—*LOCATION OF COLLIERIES IN THE SOUTHERN PART OF THE STATE.*

Name of Colliery.	Name of Company.	Name of Superintendent.	Location—County.	Post Office Address.
Caperton	William Beury, Cooper and Company	J. L. Beury	do	Caperton
New River	New River Coke Company	F. Howald	do	do
Sewell No. 1.	Longdale Iron Company	J. A. McGuffin	do	Sewell Depot
Sewell No. 2	do	do	do	do
Fire Creek	Fire Creek Coal and Coke Company	F. Howald	do	Fire Creek
Echo	William Beury, Cooper and Company	J. L. Beury	do	do
Stone Cliff, Nos. 1 and 2.	Beury Coal and Coke Company	O. C. Kubach	do	Stone Cliff
Beechwood	Beechwood Coal and Coke Company	C. C. Beury	do	
Quinnimont	Quinnimont Coal and Iron Company	D. C. Boyce	do	Quinnimont
Stirling No. 1	John Cooper and Company	John Cooper	Mercer	Coopers
Stirling No. 2	Mill Creek Coal and Coke Company	do	do	do
Buckeye	Stephenson, Mullen and Company	John D. Hewitt	do	Bramwell
Caswell	Freeman and Jones	Jenkin Jones	do	do
Reliance	William Booth and Company	James Booth	do	do

TABLE III.—SHOWING NUMBER OF EMPLOYES, &C., OF COLLIERIES IN THE SOUTHERN PART OF THE STATE.

Name of Colliery.	EMPLOYES.			No. Mules and Horses.	Kind of Mine.	Mode of Ventilation.	COAL			No. Coke Ovens.
	Inside.	Outside	Total				Seam Worked.	Thickness.	Kind	
Wellsburg Shaft	12	4	16	...	Shaft	Fan (10-foot)	...	3′ 6″	Steam	...
Wellsburg	23	5	28	6	Drift	Furnace	Pittsburg	5′ 0″	Gas	...
Coopers'	16	2	18	1	Drift	Natural	Pittsburg	5′ 0″	Gas	...
Top Mill	14	4	18	3	Drift	Furnace	Pittsburg	...	Gas	...
Fulton	13	0	13	3	Drift	Natural	Pittsburg	5′ 6″	Gas	...
Manchester	10	1	11	1	Drift	Natural	Pittsburg	5′ 0″	Gas	...
Whitaker	26	5	31	5	Drift	Fan (10-foot)	Pittsburg	5′ 0″	Gas	...
Cresent	13	1	14	1	Drift	...	Pittsburg	5′ 6″	Gas	...
Belmont	10	0	10	3	Drift	Furnace	Pittsburg	5′ 0″	Gas	...
Riverside	11	1	12	4	Drift	Furnace	Pittsburg	5′ 0″	Gas	...
La Balle	16	1	17	4	Drift	Furnace	Pittsburg	5′ 0″	Gas	...
South Side	12	5	17	2	Drift	...	Pittsburg	5′ 6″	Gas	...
Elm Grove Shaft	14	3	17	2	Shaft	Steam Jets	Pittsburg	5′ 0″	Gas	...
Boggs Run	25	2	27	5	Drift	Furnace	Pittsburg	5′ 6″	Gas	...
Benwood Iron Works	12	2	14	2	Drift	Furnace	Pittsburg	5′ 6″	Gas	...
Moundsville Shaft	80	6	86	5	Shaft	Fan (15-foot)	Pittsburg	5′ 8″	Gas	...
West Fairmont Shaft	...	...	...	...	Shaft	Exhaust Steam	Pittsburg	9′ 0″	Gas	...
Central	14	2	16	2	Drift	...	Pittsburg	7′ 0″	Gas	10
Aurora	26	3	29	2	Drift	Natural	Pittsburg	7′ 0″	Gas	...
Montana	14	1	15	1	Drift	Natural	Pittsburg	7′ 0″	Gas	20
Palatine	39	6	45	8	Drift	Natural	Pittsburg	7′ 0″	Gas	...
Gaston	75	12	87	12	Drift	Fan (12-foot)	Pittsburg	8′ 0″	Gas	...
New England	...	...	...	...	Drift	Natural	Pittsburg	7′ 6″	Gas	...
Irondale	36	4	40	3	Slope	Natural	Upper Freeport	4′ 6″	Steam & Coking	51
Mountain Brook Shaft	53	18	71	6	Shaft	Fan (10-foot)	Upper Freeport	4′ 6″	Steam & Coking	33
Austen	48	4	52	10	Drift	Natural	Upper Freeport	4′ 6″	Steam & Coking	65
Armstrong	86	12	98	7	Drift	Natural & Furnace	Cumberland	14′ 0″	Steam	...
Atlantic	100	10	110	9	Drift	Natural	Cumberland	12′ 0″	Steam	...
Elk Garden, No. 1	161	33	194	16	Drift	Furnace	Cumberland	12′ 0″	Steam	...
Elk Garden, No. 2	58	7	65	5	Drift	Natural	Cumberland	12′ 0″	Steam	...
Elk Garden, No. 4	...	...	...	...	Drift	Natural	...	...	...	...
Davis	23	4	27	2	Drift	Natural	...	4′ 10″	...	...
Tyrconnel Nos. 1 and 2	60	16	76	13	Drift	Natural	Pittsburg	8′ 6″	Gas	25
Ocean	56	4	60	7	Drift	Natural	Pittsburg	9′ 0″	Gas	...
Despard	66	10	76	20	Drift	Natural	Pittsburg	9′ 0″	Gas	18
Harrison Connty	25	2	27	4	Drift	Natural	Pittsburg	9′ 0″	Gas	6
Pinnickinnick	42	1	43	6	Drift	Natural	Pittsburg	9′ 0″	Gas	...
Farland's	9	9	18	1	Drift	Natural	Pittsburg	9′ 0″	Gas	15
Wilsonburg	25	15	40	3	Drift	Natural	Pittsburg	8′ 0″	Gas	30
New Haven	41	8	49	7	Slope	Furnace	Pittsburg	4′ 6″	Steam	...
Hartford City	29	3	32	6	Slope	Furnace	Pittsburg	4′ 6″	Steam	...
California	30	5	35	5	Slope	...	Pittsburg	4′ 10″	Steam	...
Sehon	33	7	40	7	Drift	Furnace	Pittsburg	4′ 10″	Steam	...

TABLE III.—Continued—*SHOWING NUMBER OF EMPLOYES, &C, OF COLLIERIES IN THF SOUTHERN PART OF THE STATE.*

Name of Colliery	EMPLOYES			No. Mules and Horses.	Kind of Mine.	Mode of Ventilation	COAL.			No. Coke Ovens.
	Inside.	Outside	Total				Seam Worked.	Thickness	Kind	
Mosquito	19	1	20	8	Drift	Furnace	Pittsburg	4′ 6″	Steam	
German Furnace	16	1	17	3	Drift		Pittsburg	4′ 6″	Steam	
Hope	19	1	20	5	Drift	Natural	Pittsburg	4′ 8″	Steam	
Sterling					Drift	Furnace	Pittsburg	4′ 6″	Steam	
Clifton	18	3	21	5	Drift	Furnace	Pittsburg	4′ 6″	Steam	
New Castle					Drift	Natural	Pittsburg	4′ 6″	Steam	
Camden	50	12	62	10	Drift	Furnace	Pittsburg	3′ 10″	Steam	
Totals	1578	256	1834	240						273

TABLE IV.—SHOWING NUMBER OF EMPLOYES, &C., OF COLLIERIES IN THE SOUTHERN PART OF THE STATE

Name of Colliery.	EMPLOYES.			No. Mules and Horses.	Kind of Mine	Mode of Ventilation.	COAL.			No. Cke Ovens.
	Inside.	Outside	Total.				Seam Worked.	Thickness.	Kind.	
Energetic	18	3	21	2	Drift	Natural	Pittsburg	4′ 6″	....	....
Star	175	10	185	31	Drift	Furnace	Pittsburg	5′ 6″	Block	....
Black Band	50	7	57	4	Drift	Furnace	Pittsburg	3′ 0″	Block	....
Beane's	78	6	84	8	Slope	Furnace	Campbell's Creek	5′ 6″	Splint	....
Boyce	85	28	113	30	Slope	Furnace	Campbell's Creek	5′ 0″	Splint	....
Calderwood	108	21	129	32	Drift	Furnace	Campbell's Creek	5′ 0″	Splint	....
Dana Rrothers'	81	22	103	16	Slope	Furnace	Campbell's Creek	4′ 0″	Splint	....
Pioneer, No. 4	79	13	92	7	Slope	Fan (8-foot)	Campbell's Creek	4′ 0″	Splint	....
Dickinson's	14	4	18	3	Drift	....	Campbell's Creek	4′ 0″	Splint	....
Bennington	....	....	....	....	Drift	Steam Jets.	Campbell's Creek	3′ 0″	....	....
Winifred, No 1	143	13	156	14	Drift	Furnace	Winifrede	5′ 0″	Splint	....
Winifred, No. 2	28	4	32	2	Drift	Furnace	Winifrede	5′ 0″	Splint	....
Winifred. No. 3	129	8	137	8	Drift	Furnace	Winifrede	5′ 0″	Splint	....
Black Diamond	80	14	94	10	Drift	....	Winifrede	4′ 0″	Splint	....
Peerless	88	19	107	7	Drift	Fan (7-foot)	Peerless	2′ 6″	Gas	....
Stevens' Coal Company	70	8	78	4	Drift	Furnace	Winifrede	4′ 6″	Splint	....
Coalburg, No. 1	100	22	122	18	Drift	Natural	Coalburg.	4′ 1″	Splint	....
Coalburg, No. 2	33	2	35	4	Drift	Natural	oalburg	4′ 1″	Splint	....
North Coalburg	51	13	64	6	Drift	Natural	....	6′ 0″	Splint	....
Peabody	85	10	95	7	Drift	Furnace	Coalburg	4′ 0″	Splint	....
Cedar Grove	62	10	72	8	Drift	Furn and Nat'rl.	Cedar Grove	3′ 4″	Steam	....
East Bank	36	6	42	5	Drift	Furnace	Coalburg	4′ 2″	Splint	....
Blacksburg	36	5	41	4	Drift	Fire-basket	Cedar Grove	2′ 10″	Steam	....
Kelly's Creek	36	9	45	6	Drift	Furnace	Cedar Grove	2′ 10″	Steam	....
Crown Hill	105	15	120	13	Drift	Furnace	Cannelton	4′ 0″	Splint	....
Wacomah	73	9	82	6	Drift	Fan (7-foot)	Coalburg	4′ 0″	Cannel & Splint	....
Kanawha	114	13	127	9	Drift	Furnace	Winifrede	4′ 0″	Splint	....
Union	70	15	85	7	Drift	Furn. and Nat'rl.	Winifrede	5′ 6″	Splint	....
Cannel	109	32	141	13	Drift	Natural	Cannelton	....	Cannel	....
Mount Morris	57	13	70	11	Drift	Natural	Coal Valley	5′ 6″	Gas	....
Excelsior	46	5	51	5	Drift	Furnace	Coal Valley	3′ 2″	Gas	....
Eureka	64	7	71	8	Drift	Furnace	Coal Valley	5′ 6″	Gas	....
Carver's	70	10	80	9	Drift	Fire-basket	Coal Valley.	5′ 2″	Gas	....
Stranghau's	70	7	77	9	Drift	Furnace	Coal Valley	4′ 10″	Gas	....
Coal Valley	27	4	31	4	Drift	Natural	Coal Valley	5′ 0″	Gas	....
Crescent	97	28	125	17	Drift	Furnace	Coal Valley	5′ 0″	Gas	30
Faulkner's, No. 1	23	3	26	3	Drift	Natural	Eagle	4′ 8″	Steam & Coking	....
Faulkner's, No. 2	80	5	85	11	Drift	Furnace	Coal Valley.	5′ 0″	Gas	....
Eagle	110	10	120	12	Drift	Furnace	Eagle	5′ 0″	Steam & Coking	24
St. Clair	60	20	80	7	Drift	Furnace	Eagle	5′ 0″	Steam & Coking	60
Powellton	42	35	77	4	Drift	Furnace	Coal Valley	4′ 6″	Gas & Coking	100
Great Kanawha	68	26	94	9	Drift	Fire-basket.	Coal Valley	4′ 6″	Gas & Coking	36
Hawk's Nest	120	25	145	13	Drift	Furn. and Nat'rl.	Coal Valley	7 0″	Steam & Coking.	80
Gaymont	31	8	39	3	Drift	Furnace	Sewell	3′ 0″	Steam & Coking	32

TABLE IV.—Continued—*SHOWING NUMBER OF EMPLOYES, ETC., OF COLLIERIES IN THE SOUTHERN PART OF THE STATE.*

Name of Colliery.	EMPLOYES			No. Mules and Horses	Kind of Mine	Mode of Ventilation	COAL			No. Cke Ovens.
	Inside	Outside	Total				Seam Worked.	Thickness	Kind	
Sunnyside	30	2	32	2	Drift	Furnace	Sewell	3′ 2″	Steam & Coking	.....
Elmo	34	4	38	3	Drift	Furnace	Sewell	3′ 0″	Steam & Coking	.....
Fayette	33	5	38	3	Drift	Natural	Sewell	3′ 6″	Steam & Coking	12
Nuttallburg	81	42	123	19	Drift	2 Furnaces	Sewell	3′ 9″	Steam & Coking	61
Keeny's Creek	70	7	77	6	Drift	Furnace	Sewell	3′ 6″	Steam & Coking	.....
Caperton	139	15	154	12	Drift	Natural	Sewell	4′ 0″	Steam & Coking	.....
New River	105	12	117	12	Drift	Furnace	Sewell	3′ 10″	Steam & Coking	.....
Sewell No. 1	47	60	107	9	Drift	Natural	Sewell	3′ 0″	Steam & Coking	120
Sewell No. 2	26	6	32	2	Drift	Furnace	Sewell	3′ 0″	Steam & Coking	.....
Fire Creek	150	38	188	15	Drift	Furnace	Fire Creek	3′ 0″	Steam & Coking	96
Echo	69	30	99	6	Drift	Fan (10 foot)	Fire Creek	3′ 0″	Steam & Coking	50
Stone Cliff No. 1	38	34	72	5	Drift	Furnace	Fire Creek	3′ 6″	Steam & Coking	60
Stone Cliff No. 2	57	6	63	10	Drift	Natural	Sewell	4′ 0″	Steam & Coking	.....
Beechwood	.....	.....	.....	.....	Drift	Natural	Fire Creek	3′ 10″	Steam & Coking	.....
Quinnimont	62	38	8	100	Drift	Natural	Quinnimont	2′ 8″	Steam & Coking	82
Stirling No. 1	157	35	8	192	Drift	Fan (14 foot)	Pocahontas	8′ 0″	Steam & Coking	.....
Stirling No. 2	35	14	2	49	Drift	.....	Pocahontas	8′ 0″	Steam & Coking	28
Buckeye	54	9	3	63	Drift	Fan (12 foot)	Pocahontas	6′ 0″	Steam & Coking	10
Caswell	125	15	9	140	Drift	Fan (14 foot)	Pocahontas	7′ 6″	Steam & Coking	.....
Reliance	90	6	6	96	Drift	Fan (12 foot)	Pocahontas	7′ 0″	Steam & Coking	.....
Totals for Southern part of the State	4503	925	5428	549	.....	.....	.....	.....	.....	881
Totals for Northern part of the State	1578	256	1834	240	.....	.....	.....	.....	.....	273
Totals for the State	6081	1181	7262	789	.....	.....	.....	.....	.....	1154